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AN INTRODUCTION TO AGRICULTURAL ECONOMICS

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PREFACE

Agricultural Economics now appears as a separate item in the curriculum of most degree and diploma courses in agriculture in Britain. The majority of students taking such courses will have little, if any, previous knowledge of economics or of the economist's methods of study. Moreover, the great proportion of them will have little intention of specializing in agricultural economics as such. This little book is written primarily for such non-specialist students. Its object is to give an interpretation of the economic structure of the agricultural industry in this country which, while being fairly simple, is nevertheless sufficiently systematic to give the student an introduction to the economist's technique of study.

The draft of the book was completed in 1946, but unavoidable circumstances prevented its immediate publication. The opportunity has been taken at the proof stage to make some reference to the economic implications of the very important agricultural legislation which has been passed between 1946 and 1948.

I have to acknowledge the kindness of Mr J. P. Maxton (Director of the Institute of Agrarian Affairs, Oxford), Dr K. A. H. Murray (Rector of Lincoln College, Oxford) and my colleague Mr G. B. Bisset who read the whole of the book in typescript. I am especially indebted to Mr Maxton who, after persuading me to write this book, helped me throughout with his constant encouragement and suggestions.

For help in correcting proofs and for the preparation of the index I have to thank my colleagues Miss K. Matheson and Mr T. W. Gardner.

E. T.

Reading
1946 and 1948

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AN INTRODUCTION TO AGRICULTURAL ECONOMICS

CHAPTER I

INTRODUCTORY

FARMING is variously described as an art, as a science, as a business, as an industry and as " a way of life." Agricultural economics is concerned with farming as a business and with agriculture as an industry. In the more restricted sphere of farm management the student of agricultural economics is concerned with the business problems of the farm as the producing unit of the industry. In the wider sphere of social economics he is concerned with the general economic pattern of the agricultural industry as a whole and with the forces responsible for the moulding of that pattern ; he is also concerned with the relation of the agricultural industry to other industries within the national economy as well as with its place in world economy.

From the economic standpoint the contrast implied in the common expression " agriculture and industry " is misleading, for agriculture is only one of many industrial occupations all of which are concerned with the production of the " goods " necessary to satisfy the wants of consumers. These industrial occupations can be divided into three groups according to whether they are concerned with the *growing*, with the *extracting* or with the *manufacturing* of the goods which consumers need. Agriculture, with forestry and fishing, constitute the first group, mining the second group and the making up of raw materials or semi-finished products into finished products the third group. The production unit in the first group is the farm, garden, ranch or sheep-walk, in the second it is the mine or quarry, and in the third the shipyard, steel-works or factory.

There is also a false economic contrast implied in the common distinctions made between farmers and middlemen or between manufacturers and professional people. Middlemen and professional people are members of other occupations concerned not with the production of material goods but with the production of " services " which are equally necessary for the satisfaction of the wants of consumers. Goods and services together constitute the community's wealth, for in the economic sense wealth is the sum of " utilities " available to satisfy the wants of the community. It is necessary to emphasize this fact that all who supply goods or services are producers in the economic sense, for all are concerned with economic activity whose principal aim is to serve consumers. The consumer's need for food is not satisfied by the producing of food on the farm. That food must be brought to the consumer in the form and quantity he needs, and when and where he needs it.

The sharing of economic activity between separate groups of producers such as farmers, miners, manufacturers, middlemen and professional people is a very old form of *division of labour*, and division of labour is the most important of all economic conceptions. Indeed economic history is mainly the story of man's attempt to exploit the benefits of division of labour until in the modern world specialization forms the very basis of economic life. It is the function of the economic system to ensure such a division of labour as will result in the optimum production of goods and services. The optimum production of goods and services in turn is that which will result in the greatest degree of consumer satisfaction. Put in homelier terms this means that the job of the economic system is to balance supply with demand.

Under the economic system known as free competition the price mechanism is supposed to bring about this state of equilibrium. The theory is that if there is an expanding or unsatisfied demand for any goods the prices which consumers will pay for these goods will become sufficiently attractive to induce existing or new producers to produce new supplies to meet the unsatisfied demand. On the other hand, the production of goods will diminish if the prices consumers are prepared to pay for them are considered inadequate to induce producers to go on producing.

By deciding what is to be produced and in what quantities the price mechanism, in effect, also decides what occupations we shall follow. For example, if a community has too many farmers, or too much farming, it means that the quantity of farm goods produced is in excess of the needs of consumers. The price of farm products will therefore tend to fall. This fall in the price of farm products will discourage farmers ; farmers will tend to produce less, and some of them will leave the occupation of farming for other occupations producing other goods or services of which there is not enough to meet the demands of consumers. Eventually the number of farmers left will be that number which will be just enough to produce all the farm goods which consumers need and no more. There are differences of opinion about the efficiency with which the freely working price system performs this very important function ; but there can be no difference of opinion that if this function is not performed by some agency or other then economic progress would not be possible.

It is estimated that roughly two-thirds of the total population of the world are still occupied in agriculture, and a high proportion of these are engaged in a form of self-subsistence farming where production for sale to non-farmers is relatively unimportant. This really means that division of labour is only beginning to be exploited over large areas of the world, and the general standard of living of these areas is relatively very low. In most countries of the western world where advantage has been taken of the possibilities of division of labour, there has, on the contrary, been both a progressive and an impressive improvement in the standard of living. It has been a feature of all these western countries that the improvement of their standard of living has been accompanied by the commercialization of agriculture, i.e. by replacing farming for subsistence with farming for exchange. It has also been accompanied in most countries by a substantial reduction in the relative amount of their economic resources (especially manpower) expended on the production of food.

There is a second aspect of division of labour which has also profoundly affected the relative importance of agriculture in the economy of different countries. This is the so-called territorial or geographical division of labour—the real reason why countries trade with each other. In considering this form of division of labour economists have formulated the *theory of comparative cost or comparative advantage*, which states simply that it is in the interest of the world that countries should concentrate on the production of those goods and services in the production of which they possess the greatest degree of comparative advantage. Applied to any particular country this means that it is in its interest to produce those things which it can make more cheaply than buy, and to purchase from other countries those things which it can buy more cheaply than make. By adopting the policy of free trade Britain accepted this principle in the last century. The result was that we concentrated on production from our manufacturing and mining industries while buying more and more of our agricultural products from other countries. One consequence of this development has been that the proportion of gainfully employed persons engaged in agriculture in this country is the lowest in the world.

There are two other forms in which division of labour is manifested in economic life, and these two forms have exerted a paradoxically negative influence on the agricultural industry, for both of them have a much more restricted scope in agriculture than in most other industries.

One of them is the familiar division of crafts into their component processes. It was this form of division of labour into minute processes which attracted the attention of Adam Smith in the eighteenth century, and which has been such a feature of the subsequent development of manufacturing industry with its machine technique. In the main this form of division of labour has had no counterpart in agriculture. Adam Smith clearly foresaw this, and in a well-known passage in *The Wealth of Nations* he discusses its limitations in farming. " The nature of agriculture," he wrote, " does not admit of so many subdivisions . . . as manufactures. . The spinner is almost always a distinct person from the weaver; but the ploughman, the harrower, the sower of the seed and the reaper of the corn are often the same."

The other is the division of labour between functions and especially the division between the entrepreneur, the capitalist and the manual worker. This form of division of labour has had a profound influence on the evolution of our manufacturing and mining industries. But so far, even in this country, agriculture has not developed what has been called " the characteristic capitalist structure." On the contrary, the business of farming is still in the main carried on in small units, with the farmer himself (with the help of his family) performing the triple functions of entrepreneur, capitalist and manual worker.

The comparative absence of these last two forms of division of labour in the farming industry coupled with the fact that farming of necessity must be carried on in the countryside, while most manufacturing industries are located in urban areas, is probably responsible for the false dichotomy implied by the common contrast of farming and industry already referred to above. It is certainly important to appreciate that agriculture possesses many economic and technical characteristics which set it apart from most other industries, and much of this book has to do with these. But at the outset it is even more important to emphasize that agriculture is subject to the play of the same general economic forces as all other industries. In an exchange economy all industries, including agriculture, are concerned with the production of goods for sale to consumers. All industries, therefore, come within the same economic framework, and the same economic laws and principles will apply to each and all.

BIBLIOGRAPHY

The reader with no previous familiarity with economics will find it useful to consult some general textbook on the subject. There are many available and any one of the following can be recommended :

Clay, H., *Economics for the General Reader* (2nd Ed., London 1942)
Benham, F., *Economics* (3rd Ed., London 1943)
Cairncross, A., *Introduction to Economics* (London 1944)
Hicks, J. R., *The Social Framework* (Oxford 1942)

A succinct but clear account of the theory of the competitive system is given in Chapter I of *Plan or No Plan* by Barbara Wootton (London 1934). The well-known statement of the importance of division of labour and its limitations in agriculture given in the first three chapters of Adam Smith's *The Wealth of Nations* is still incomparable. A brief but comprehensive statement of the distinguishing characteristics of the agricultural economy is given by J. P. Maxton in *Manpower in Agriculture* (Manchester Statistical Society, December 1939).

So far, five general textbooks on Agricultural Economics have been published in this country, and all five have been freely drawn upon in the writing of this book. They are :

Rew, Sir Henry, *A Primer of Agricultural Economics* (London 1927)
O'Brien, George, *Agricultural Economics* (London 1929)
Jones, J. Morgan, *Economeg Amaethyddiaeth* (Cardiff 1930)
Venn, J. A., *The Foundations of Agricultural Economics* (2nd Ed., Cambridge 1933)
Cohen, R. L., *The Economics of Agriculture* (Cambridge 1940)

There are many Agricultural Economics textbooks written with an American background. Readers in this country will find the following useful :

Carver, T. N., *Principles of Rural Economics* (New York 1911)
Gray, L. C., *Introduction to Agricultural Economics* (New York 1924)
Taylor, H. C., *Outlines of Agricultural Economics* (New York 1925)
Holmes, C. L., *Economics of Farm Organization and Management* (New York 1928)

The bulk of the general literature on Agricultural Economics is to be found, however, in periodical journals, in official reports and in the miscellaneous publications of the Agricultural Economics

Departments of Universities and Agricultural Colleges. The more important journals (with the abbreviations used to denote them) referred to in this book are to be found, however, in the publications of the Agricultural Economics Departments of Universities and Agricultural Colleges, in official government reports and in periodical journals.

Readers should look out for the miscellaneous publications of the following academic institutions: the Agricultural Economics Research Institute and the Institute of Agrarian Affairs, University of Oxford; the agricultural economics departments of the Universities of Bristol, Cambridge, Durham (King's College, Newcastle-upon-Tyne), Leeds, London (Wye College), Manchester, Nottingham, Reading, and Wales (University College of Wales, Aberystwyth); the economics departments of the three Scottish Agricultural Colleges of Aberdeen, Edinburgh, and Glasgow; and the economics research department of Dartington Hall, Devon.

Special reports published by His Majesty's Stationery Office are indispensable, and many of these are referred to in the text.

Finally, much of the relevant literature is published in periodical journals. The more important journals (with the abbreviations used to denote them in this book) are:

The Economic Journal (E.J.)
Journal of the Royal Statistical Society (J. of R.S.S.)
The Farm Economist (F.E.)
Journal of Proceedings of the Agricultural Economics Society (J. of A.E.S.)
Proceedings of the International Conference of Agricultural Economists (P. of I.C.A.E.)
International Journal of Agrarian Affairs (I.J. of A.A.)
(*American*) *Journal of Farm Economics* (J. of F.E.)
Agriculture (*The Journal of the Ministry of Agriculture*) (J. of M.A.)
Scottish Agriculture (*The Journal of the Department of Agriculture for Scotland*) (S.J.A.)
The Welsh Journal of Agriculture (W.J.A.)
Journal of the Royal Agricultural Society of England (J. of R.A.S.E.)
Transactions of the Highland and Agricultural Society of Scotland (T. of H. and A.S. of Scotland)
Journal of the Farmers' Club (J. of F.C.)

CHAPTER II

THE OUTPUT OF BRITISH AGRICULTURE

THE size of any industry can be measured in terms of the use it makes of the three factors of production—land, capital and labour. It can also be measured in terms of the value of its output and in terms of the contribution which it makes to the national income. A discussion of the amount of land, capital and labour used in British agriculture is given in later chapters of this book. The present chapter confines itself to the measurement of output, for a discussion of the output of the agricultural industry is at the same time a discussion of its main purpose in the national economy. This purpose is to produce the goods which consumers require.

VALUE OF GROSS OUTPUT

Official estimates of the output of the chief industries of the country have been made under the Census of Production Acts of 1906 and 1917. The first census of production in Great Britain was taken in 1907, and later ones in 1924, 1930 and 1935. The agricultural industry was excluded from the operation of the Act of 1906 because the agricultural statistics which had been collected annually since 1866 were deemed to be sufficient. Concurrent censuses of the agricultural output were published, however, for 1908, for 1924–25 and for 1930–31. Since 1931 revised figures were included annually in *Agricultural Statistics* up to and including 1939.[1]

Agricultural Statistics is an annual publication issued by the

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[1] The publication of *Agricultural Statistics* was suspended in 1939, though the statistics were collected as usual on 4th June each year. The June returns were supplemented, moreover, by other statistics collected on a quarterly basis. The June statistics for 1939 to 1944 were published in 1947 as *Agricultural Statistics 1939–1944* (H.M.S.O., 1947); but since the changes they exhibit reflect mainly war-time conditions they have not been incorporated in the tables given later in this chapter.

Ministry of Agriculture and Fisheries. It is based mainly on a postal return made by the occupiers of land in England and Wales on 4th June each year. Up to 1925, with the exception of the four war years from 1914–18, these returns were made voluntarily. The Agricultural Returns Act of 1925, however, made it compulsory for all persons who, on 4th June, occupy more than 1 acre of agricultural land, to make a return in respect of that land, the returns to be used for compiling the annual *Agricultural Statistics*. The main object of this annual publication is to show as accurately as possible the total acreages under each kind of crop, the total numbers of each type of livestock and the total number of workers employed on the agricultural land of the country. *Agricultural Statistics* also gives a summary of the official estimates of the average prices of agricultural produce and of the average yields of crops and of livestock products each year. As stated above, since 1931 estimates of the value of the agricultural output have also been given. This annual official publication is of the greatest importance to the agricultural economist, for it gives him much of the statistical information about the industry which he requires.

The Agricultural Returns Act, 1925, is repealed by the provisions of the Agriculture Act, 1947, which gives very wide powers to the Minister of Agriculture and Fisheries to obtain agricultural statistics from farmers and owners of land used for agriculture. The statistics which can be called for cover a much wider field than those collected under the 1925 Act. Together with other information to be collected from agricultural merchants under the Statistics of Trade Act, 1947, they are needed for the purposes of the February price reviews[1] as well as for the general planning of the industry and for the Government's periodical economic surveys.

The last published estimates of the value of the gross agricultural output before the war are for 1937–38, when it was put at £264,565,000—£224,220,000 for England and Wales, and £40,345,000 for Scotland. It is necessary to understand clearly what these figures represent.[1] In estimating the value of the gross output care is taken to exclude the value of inter-farm sales, i.e. the value of crops and livestock sold by one farmer to another for farming purposes is left out of the calculation. The value of crops grown by a farmer to feed to his own livestock or to use as seed on his own farm is also excluded. But the estimated value of crop and livestock products produced on the farm and consumed by the farmer and members of his family *as consumers* is included. In effect, the method adopted assumes that the agricultural land of the country is one large farm, and the gross output is the value of the total sales from this national farm. In other words, the figure of £264,565,000 represents the estimated value of the products sold by the farmers to the non-farming community, plus the estimated value of their own farm produce used by the farmers and by members of their households as consumers.

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[1] See p. 286

The calculation of the gross agricultural output is done in terms of money, since money is the only common denominator in which all the different products constituting the gross output can be expressed. It should be pointed out that the value of the gross output as given in Table I is not the same as the value of the gross receipts of farmers. In the first place, as already stated, gross output excludes the receipts which many farmers obtain by selling farming raw materials to other farmers. Secondly, it does not include certain state payments to the industry given to support certain branches of farming; for example, it does not include (for 1937–38) subsidies paid to the producers of fat cattle, wheat, barley or oats. Such price subsidies must be deducted since the object is to ascertain the value of the contribution which the farmers themselves make to the national supply of goods.

A study of the list of products shown in Table I teaches much about the economic as well as the farming characteristics of the agricultural industry in this country.

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[1] Particulars of the method used in making the calculation are given in *The Agricultural Output of England and Wales, 1930–1931* (Cmd. 4605, 1934), pp. 36–8.

Table I—Estimated Value of the Gross Output of the Agricultural Industry in Great Britain for the Year 1937–38

	£	Per cent
Livestock and livestock products		
Cattle and calves	41,580,000	15·7
Sheep and lambs	21,770,000	8·2
Pigs	27,130,000	10·3
Milk and dairy produce	68,080,000	25·7
Poultry	5,850,000	2·2
Eggs	19,760,000	7·5
Wool	2,410,000	0·9
Total	186,580,000	70·5
Farm crops		
Wheat	7,110,000	2·7
Barley	5,060,000	1·9
Oats	3,950,000	1·5
Mixed corn, rye, beans and peas	510,000	0·2
Potatoes	14,510,000	5·5
Sugar-beet	4,780,000	1·8
Hops	1,980,000	0·7
Hay	3,374,000	1.3
Straw	1,010,000	0·4
Seeds	186,000	0·1
Total	42,470,000	16·1
Horticultural products		
Fruit	8,019,000	3·0
Vegetables	18,210,000	6·9
Glasshouse produce, flowers grown in the open and nursery stock	9,233,000	3·5
(Honey : Scotland only)	53,000	0·02
Total	35,515,000	13·4
Total value of gross output	264,565,000	100·0

COMPOSITION OF GROSS OUTPUT

From the economic point of view agriculture should be regarded as a generic term covering the complex of industries concerned with producing wealth by the growing of crops and by the rearing of livestock. In this country agriculture is concerned with the production of a great variety of products. Twenty different varieties are listed in Table I, and many of these include several distinct lines. In the table these products are grouped into the three categories of livestock and livestock products, farm crops and horticultural products. But from the economic standpoint it is useful to group the products of farming into two main classes on the basis of what happens to them after they leave the farm.

The first group includes those products which are consumed in the form in which they leave the farm except that some of them have to be cooked. Examples listed in the table are milk and dairy produce, eggs, potatoes and most horticultural crops. Technically these goods are called *consumer goods*, i.e. they are goods which directly satisfy the wants of the persons who buy them.

The products in the second group leave the farm in a form in which they are *not* used by their ultimate consumers, for after they leave the farm they are used as the raw material for other industries. Technically such products are called *producer goods* and they include the following categories: (*a*) Products used as the raw materials of the food-processing industries, e.g. livestock for butchering, wheat for flour-milling, barley and hops for brewing, milk for factory-made cheese and butter, beet for sugar-refining and fruit for jam-manufacture. In the not very distant past farmers undertook much of this processing themselves, but today most of it in this country is delegated to non-farming occupations. (*b*) Food products used as the raw material for making consumer goods other than food. Important examples are the use of milk, potatoes, etc. for making plastics, industrial alcohol, starches and many other products. (*c*) Certain non-food products such as wool, hides, straw and flax.

Both from the economic and from the agricultural standpoint the most important feature brought out by the table of gross output is the predominance of livestock farming in British agriculture. In 1937–38 livestock and livestock products accounted for over 70 per cent of the total value of the gross output of the industry. From the agricultural standpoint it must be remembered, however, that the amount included for farm crops is far below the total value of the crop production of the land since, as already stated, the value of crops grown for livestock feed and for seed has been excluded. In this way, for example, grass which is the most important of all British farm crops does not figure at all as such in the computation of the gross output of the industry. The fact of such quantities of crop products, including grass, being excluded from the gross output means, of course, that the primary function of crop production in British agriculture is to help in the production of livestock and livestock products.

Of the livestock, cattle are easily the most important, for sales of cattle and cattle products together accounted for over 41 per cent of the gross agricultural output in 1937–38. This preponderance of cattle is, in turn, dependent on the part cattle play in dairy farming. Thus dairy products (mostly milk) accounted for 25·7 per cent of the total farming output, and a substantial proportion of the cattle sales should also be regarded as a by-product of dairy farming. It is clear, therefore, that the production of milk for sale is by far the most important single enterprise in British agriculture. It has no near rival.

The other major products, in order of importance as measured by their financial contribution to the gross output of the industry in 1937–38, were : horticultural crops (13·4 per cent), pigs (10·3 per cent), poultry and eggs (9·7 per cent), sheep and wool (9·1 per cent), cereals (6·3 per cent) and potatoes (5·5 per cent).

This preoccupation of British agriculture with the production of milk, poultry and eggs, and fruit and vegetables reflects the wholehearted adoption by this country of the policy of free trade. On the one hand, this policy has meant the exploitation of the comparative advantage which British farmers enjoy in the production of these particular commodities. There have been three important aspects to this comparative advantage, viz. (*a*) proximity to an expanding first-class market for the relatively high-priced food and other products concerned; (*b*) the enjoyment of a certain measure of monopoly by British farmers in the supply of these products resulting from the degree of natural protection conferred by their perishable nature—in other words the products concerned were not subject to a world market or a world price; (*c*) the existence of splendid physical conditions for the intensive growing of the products and especially for the production of milk. On the other hand, the availability of ample imported supplies of the relatively low-priced human food products (especially wheat, second quality meats and butter and cheese) together with the availability of cheap imported supplies of certain animal feeding-stuffs and fertilizers has been a *sine qua non* of the existence of the general situation.

Nevertheless Table I shows that several highly competitive agricultural commodities continue to be produced in this country because in certain conditions it is profitable to do so. There are three reasons for this. First, some of the agricultural land of the country—if it is to be farmed at all—is suitable only for certain products, e.g. cereals in some parts of East Anglia and sheep on the mountains of Scotland and Wales. Secondly, technical considerations render it necessary to produce some commodities which, although relatively unprofitable in themselves, are still necessary for systems of farming mainly concerned with the growing of the more profitable products. This is in turn partly associated with the complementary nature of many farm products and with the problem of maintaining soil fertility, which is a technical problem peculiar to the farming industry. Lastly, since 1924 and especially since 1931, State assistance and the limitation of imports were specially designed, for reasons other than economic, to assist the production of certain commodities such as sugar-beet, wheat and fat cattle in this country.

Following general economic practice, farmers in this country had by 1939 gone far, within certain technical limits of soil and climate, to substitute the growing of relatively more profitable for relatively less profitable products. From the eighteen-eighties onwards this entailed significant changes in farming systems, and these changes have been reflected in certain well-known secular trends in the acreages of crops grown and in the numbers of livestock kept. The more important of these trends are illustrated by the figures in Table II which summarizes the changes for the half-century between 1889 and 1939.

These long-period trends were temporarily halted and reversed during the years between 1914 and 1918, as they have again been reversed since 1939. In view of the probably temporary nature of many of the changes which have occurred since 1939, and in view also of the somewhat fragmentary nature of the statistical data available since that date, the discussion of the economic structure of British agriculture in this chapter, as indeed in most of this book, is based mainly on the position in 1939.

From the farming standpoint the more important changes in the fifty years up to 1939 were as follows : (*a*) a drop of over 3·5 million acres, or 10·8 per cent, in the total cultivated area (i.e. in all agricultural land other than rough grazings) due mainly to the transfer of land to non-agricultural uses ; (*b*) a big drop in the actual and in the relative importance of arable land, 51·5 per cent of the total cultivated area being under the plough in 1889 as compared with only 40·6 per cent in 1939 ; (*c*) a drop of 34·5 per cent in the acreage of corn crops, the drop being specially heavy for the "cash" grains, barley and wheat ; (*d*) a drop of 59·0 per cent in the combined acreage of turnips, swedes and mangolds which constitute the bulk of the root break ; (*e*) an increase in most of the other arable crops, i.e. potatoes, sugar-beet, vegetables

TABLE II—Acreages of Crops and Grass and Numbers of Livestock in Great Britain in 1889 and in 1939

	1889	1939	Difference between 1889 and 1939
	Acres	Acres	Acres
Area of tillage	11,990,196	8,342,307	– 3,647,889
Area of temporary grass	4,877,298	3,527,778	– 1,349,520
Area of arable land	16,867,494	11,870,085	– 4,997,409
Area of permanent grass	15,865,863	17,331,387	+ 1,465,524
Total Area of Crops and Grass	32,733,357	29,201,472	– 3,531,885
Wheat	2,449,354	1,762,697	– 686,657
Barley	2,121,530	1,009,670	– 1,111,860
Oats	2,888,704	2,135,294	– 753,410
Other grain crops	615,584	381,306	– 234,278
Total Area under Grain Crops	8,075,172	5,288,967	– 2,786,205
Potatoes	579,222	588,660	+ 9,438
Sugar-beet	—	344,651	—
Turnips, swedes and mangolds	2,246,769	920,484	– 1,326,285
Other crops	575,713	825,800	+ 250,087
Bare fallow	513,320	373,745	– 139,575
	Number	Number	Number
Horses	1,421,389	987,415	– 433,974
Cows and heifers in milk or in calf	2,433,639	3,614,544	+ 1,180,905
Other cattle	3,705,916	4,504,244	+ 798,328
Total cattle	6,139,555	8,118,788	+ 1,979,233
Total sheep	25,632,020	25,992,793	+ 360,773
Total pigs	2,510,803	3,767,365	+ 1,256,562
Total poultry	36,783,948*	64,137,000	+ 27,353,052

* This figure is for 1913

and fruit; (*f*) a substantial increase of 1·5 million acres under cultivated permanent grass; (*g*) large increases in the numbers of cows (32·2 per cent), and pigs (50·0 per cent), and in the number of poultry[1]; (*h*) the comparatively small change in the total number of sheep which masks important differences in the trends of the "arable" and the "grass and hill" types of sheep, the former dropping very appreciably and the latter increasing in number, e.g. the total sheep flock in England decreased by 15·8 per cent, but in Wales it increased by 63·6 per cent and in Scotland by 15·2 per cent; (*i*) a drop of 30·5 per cent in the number of horses on farms.

The influence of all these changes on the utilization of the agricultural land of the country by 1939 is illustrated further by the figures given in Table III. These figures show the acreages of crops grown and the numbers of livestock kept per 1,000 acres of cultivated land for the whole of Great Britain and for each of the three countries. The acreages of rough grazings, which are in addition to the cultivated area, are also shown. The contrast in the figures for the three countries will help to emphasize that British agriculture, in spite of the general trends mentioned above, still exhibits a big range of technical structure.

Likewise, from the economic standpoint, although British agriculture as a whole has tended to become more specialized, concentrating its resources on the production of milk, pigs, poultry and horticultural products, it nevertheless continues to produce a big range of products. In spite of some tendency to specialize, the majority of the farms of the country are still concerned with the production of several products.[2]

NET OUTPUT

So far we have been considering the value of the *gross output* of the agricultural industry. But the more significant

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[1] The figures for poultry for the whole of Great Britain have only been available since 1913.

[2] See p. 103

TABLE III—Crops grown, area of rough grazings and numbers of livestock per thousand acres of cultivated land in Great Britain in 1939

	Per 1000 acres of cultivated land			
	England	Wales	Scotland	Great Britain
Wheat	76	5	17	60
Barley	40	8	22	35
Oats	55	60	171	73
Other grain crops	16	6	1	13
Total Grain Crops	187	79	211	181
Potatoes	20	6	30	20
Sugar-beet	15	—	2	12
Turnips, swedes and mangolds	26	12	69	31
Other crops	36	9	9	28
Bare fallow	16	2	4	13
Total Tillage	300	108	325	285
Temporary grass	83	91	319	121
Total Arable	383	199	644	406
Permanent grass	617	801	356	594
TOTAL CULTIVATED LAND	1000	1000	1000	1000
Cultivated permanent and temporary grass	700	892	675	715
Rough grazings	173	672	2296	550
Horses on farms	33	47	31	34
Cows and heifers in milk or in calf	125	136	112	124
Other cattle	144	182	184	154
All cattle	269	318	296	278
All sheep	608	1724	1757	890
All pigs	151	77	55	129
All poultry	2370	1634	1692	2196

measurement for the student of agricultural economics is the value of the *net output*. The value of the net output is obtained by deducting from the value of the gross output the value of the purchased materials not produced on farms which have been used by farmers in producing the products which they sell to the non-farming community. Unfortunately no satisfactory figures are available to enable this apparently simple but really very complicated calculation to be made.

The last published official attempt to do this was in 1929, when it was approximately estimated that the average amount paid annually by farmers for *imported* materials used for production during the previous four years was in the region of £78 million, or about one-quarter of the value of the gross output.[1] It does not follow from this that the net output of the industry constituted, by value, three-quarters of the gross output, for not all the purchased materials used by farmers are imported. The calculation, however, does in a sense give a useful indication of the extent to which the agricultural output is wholly produced from British resources.

It also emphasizes one important feature of British farming, which is its reliance on imported raw materials. The main items under this head are livestock feed, artificial fertilizers, seeds and store cattle. By far the most important of these is imported animal feed. Indeed, in appraising the significance of livestock in British agricultural economy it is essential to remember that roughly 25 per cent of the food consumed by our farm animals before 1939 was imported at a cost of about £40 million per annum.[2] These figures show the extent to which farming in this country had become a processing industry purchasing from abroad much of its raw materials, and notably animal feeding-stuffs, and working them up into human foodstuffs through the agency of dairy cows, pigs and poultry.

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[1] *The Agricultural Output and the Food Supplies of Great Britain* (H.M.S.O. 1929), pp. 9–13

[2] N. C. Wright, "The Importance of Home Produced Feeding-stuffs" (*T. of H. and A.S. of Scotland*, 1938)

A more recent, but not official, estimate of the net output of agriculture for 1938–39 is available.[1] According to this estimate agriculturists in the United Kingdom (i.e. in England, Wales, Scotland and Northern Ireland) used £123½ million worth of purchased goods and services (£70 million of feeding-stuffs, £15½ million of livestock, £14½ million of fertilizers and seeds, and £23½ million of machinery, etc.) to produce a gross agricultural output valued at £294½ million. This computation gives a net output of £171 million, i.e. a net output equal to about five-eighths by value of the gross output.

The net output of agriculture represents also the net income of the industry. In other words it is the fund available for the remuneration of the various agents of production in the form of rent, interest, wages and profits, and out of which rates and taxes must also be paid. Considered as net output it measures the contribution of the industry to national wealth. Considered as net income it measures the reward of the industry for making that contribution. The value of the net output and the net income is conditioned by two main considerations: (*a*) the efficiency with which the gross output has been produced on the farms, and (*b*) the general price conditions within which the production has been carried on. The rest of this book is concerned with a discussion of these two considerations.

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[1] J. H. Kirk, "The Output of British Agriculture during the War" (*J. of A E.S.*, vol. vii, No. 1, 1946), p 37

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CHAPTER III

LAND AS A FACTOR OF PRODUCTION

IN the previous chapter the terms "gross output" and "net output" of agriculture were used. Both terms are necessarily associated with a period of time, usually one year. For example, the figures showing the gross output of agriculture given in Table I represent the money values of the goods sold by farmers during the year 1937–38. In producing these goods the farmers used their farm lands; they used their farm buildings, machinery, livestock, manures, seeds and other producer goods; and they used human labour. These are the agents or factors of production, and it is usual to classify them into the three groups of *land*, *capital* and *labour*. This chapter deals with land as a factor of production in agriculture.

NATURAL RESOURCES IN PRODUCTION

The definition of land as a factor of production should be wide enough to include in the term all the forces of nature which assist man in the production of wealth. Indeed, it is better to talk of *land and other natural resources* as being the first factor of production. There is a tendency for modern economists to adopt the view that there is no fundamental difference between land and capital that justifies their classification into two separate factors. It is claimed that land has so many things in common with other economic goods that it is in practice almost impossible to maintain the distinction between them. Thus farming land, especially in an old-established country like Britain, is largely artificial, i.e. it is as much the result of human effort as of nature's bounty. But every tract of land carries with it certain qualities, such as advantages of climate, aspect, situation, etc., which are entirely outside the influence of man. Even from the point of view of general economic theory these fixed qualities in land justify the consideration of land as a separate factor. From the point of view of agricultural economics such a separation has everything to commend it.

This is brought out clearly by a consideration of the twofold function which land performs as a factor of production in agriculture. These two functions are to provide floor space and to act as the repository for all the elements necessary for the growth of plants and animals.

Every act of production must have some floor space on which it is conducted. It is the first and most elemental function of land to provide this floor space for both farm and factory. But agriculture requires much larger areas of floor space in relation to the scale of its operations than does any other industry. That is why the bulk of the land surface is devoted to farming even in a predominantly manufacturing country like Britain. Thus it was estimated that in 1937 82·1 per cent of the 58,340 square miles of land in England and Wales was used for agriculture, notwithstanding that less than 10 per cent of the population was engaged in farming.[1] This unparalleled demand of agriculture for land is so obvious that it needs no emphasis.

The second function of land in agriculture is to act as the repository for the natural forces—partly physical, partly chemical and partly biological—which together are essential for the growth of plants and animals. Agriculture is unique amongst industries in its fundamental dependence on these natural forces, for all the processes of farming are processes of growth, and none of its products is manufactured or made. This accounts for the farmer's preoccupation with the soil, and above all with the maintenance of soil fertility which to him is the practical manifestation of the source of growth. Soil fertility includes all the climatic, geological and other natural factors which determine how far land can be used for the production of crops or for the growth of livestock. But soil fertility is difficult to define in precise terms, and much argument continues to centre on it. For the present purpose it is sufficient to say that, whatever it may be, soil fertility is conserved under any system of farming provided such a system is technically capable of being continued indefinitely. Indeed, a system of production from land which does not conserve soil fertility should rightly be regarded as belonging not to agriculture but to mining. In this connection the definition of agriculture as " the utilization of the natural fertility of the soil for the production of commodities serviceable to man "[1] is very apt.

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[1] *Report of the Committee on Land Utilisation in Rural Areas* (Cmd. 6378, 1942), p. 2

CHARACTERISTICS OF LAND AS A FACTOR OF PRODUCTION

Land as a factor of production has three characteristics which are of the greatest significance both to the economist and to the farmer. The first is that land is pre-eminently subject to the law of diminishing returns ; the second is that land is limited in quantity ; the third is that land is heterogeneous in quality.

A discussion of the general implications of the law of diminishing returns, one of the oldest and most famous of economic laws, is given later in Chapter VI. For the purpose of the present chapter the law can be stated as follows : *Successive inputs of capital and labour applied to a given area of land must ultimately, other things remaining the same, yield a diminishing output for each additional unit of input.* The two terms *input* and *output* used in this definition are very useful terms, for between them they convey the essentials of the process of production. Inputs of labour and capital are used in every industry, including farming, for the sole purpose of obtaining outputs the value of which is higher than the cost of the inputs used. That is how wealth is increased. That is also how producers are rewarded. Everything depends on the value or the price of the outputs being more than the value or the cost of the inputs.

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[1] Sir Henry Rew, *A Primer of Agricultural Economics*, p. 14

The law of diminishing returns is simply a generalization based on the universal experience of all farmers. Every farmer is aware of it, for every farmer knows that there is a limit to the output which he can obtain from any one field on his farm. He knows that by applying more labour and capital to any one field he can increase the output from it up to a certain point. But he also knows that after that point is reached the increase in output for each successive increase in input will become proportionately smaller. It will pay him to go on getting less until the extra outputs are definitely less in value than the costs of the extra inputs. Beyond this stage he would not be justified in expending any more labour and capital on the field concerned. If this were not so there would be no point in any farmer cultivating more than a small area of land. But because it is so farmers have always been ready to occupy more land rather than push the intensity of production on a limited area. It is this attempt to avoid the incidence of diminishing returns that makes agriculture relatively so extravagant in the use of land as a factor of production.

In view of both the intensive and extensive demand which agriculture makes on land it is a matter of concern that land itself should be limited in quantity while the other factors of production are capable of expansion by man. As a factor of production in agriculture, land is limited in two senses. Firstly, the land area of the world is itself limited in extent. Secondly, large sections of the world's land area are, for obvious physical reasons, of no use whatever for farming purposes, in fact it is estimated that only about 11 per cent is capable of cultivation now or in the near future. From the point of view of individual farmers not only is land scarce but it is also, for most of them, the one factor of production which is, for all practical purposes, fixed in supply. This is particularly true of settled countries like Britain where it is not possible for the majority of farmers to increase or to decrease the land area which constitutes their farms.

In his famous *Essay on the Principles of Population*, Malthus was concerned with the significance of this scarcity of land in its bearing on the relation between the growth of food production and the growth of population. Writing at the close of the eighteenth century he believed that population was outstripping food supplies, since these were circumscribed by the incidence of diminishing returns on a fixed quantity of land. So far, however, his grim foreboding about persons " for whom no place is set at the table of nature " has not materialized. There have been three principal reasons for this. Firstly, since the days of Malthus vast new areas of virgin land have been added to the total cultivated area, and the resources of these new lands have enabled the big increase in world population to proceed without there being any real danger of famine. Secondly, there has been a great advance in the technical efficiency of farming itself, due in the main to the application of science. In a sense it is the main function of the agricultural scientist to wage war on diminishing returns, and so far, he has had notable successes. The more spectacular of these successes have been the use of improved rotations and manures, the use of improved breeds of plants and of animals and the use of mechanical power especially the internal combustion engine. Thirdly, the bogy of population growth itself has largely disappeared, for there is now occurring a radical change in the rate of population increase in most countries of the western world. This change can be summed up by saying that the era of rapidly expanding numbers appears to be coming to an end, and is being replaced by a phase of stationary if not of diminishing numbers.

While a discussion of the relation of population to food supplies belongs more to the study of population than to the study of land, one historical aspect of it is of special significance to the agricultural economist. This follows from the fact that, in order to avoid the consequences of diminishing returns and at the same time meet the increasing demand for food from a growing population, people have looked for and have cultivated more and more land. It is here that the third characteristic of land, i.e. its heterogeneous quality becomes significant. This heterogeneity may derive from the complex of fertility associated with the great range of soil types, altitude. configuration, aspect, climate, etc. Or it may derive from variations in situation in relation to other economic resources used in production and in relation to markets. In the absence of diminishing returns inferior lands (either from the point of view of fertility or accessibility or both) would be left uncultivated and all the food would be grown on the best land. It is the use of land of varying grades of economic capacity that gives rise to two other important economic concepts—the concept of *economic rent* and the concept of the *margin of cultivation.*

ECONOMIC RENT AND THE MARGIN OF CULTIVATION

Rent in everyday speech means a periodic payment made by one person (the tenant) to another person (the owner) for the loan or lease of a piece of land, or a farm, or a house. Economic rent is a very different thing. Ricardo, who was the first to define it, called it the payment obtained for " the original and indestructible powers of the soil." Its essential feature is that it is a *differential* reward which the more fortunate producers obtain as a result of the unequal distribution of the " free gifts of nature," i.e. those elements in land which are not man-made.

The concept of economic rent can best be explained by a simple hypothetical illustration. Suppose three farmers A, B and C of equal technical ability use the same inputs per acre of labour and capital to produce wheat on their farms. As a result of the varying natural fertility of their lands, however, A gets an output of 30 cwt. per acre, B an output of 20 cwt. per acre and C an output of 15 cwt. per acre. In the production of wheat, therefore, A has an advantage over B and a still greater advantage over C, while B has also an advantage over C. Now this relative advantage is entirely fortuitous for it is due to conditions completely outside the influence of the farmers themselves. It is this fortuitous advantage which is the basis of economic rent.

In the illustration *the economic rents per acre in respect of wheat production* on the three farms concerned can be expressed as follows :

the economic rent of A over B = the value of 10 cwt. of wheat
the economic rent of A over C = the value of 15 cwt. of wheat
the economic rent of B over C = the value of 5 cwt. of wheat.

So long as land inferior in quality to that of C is not required for wheat production, C's farm will possess no economic rent so far as wheat production is concerned. Under these circumstances C is known as the *marginal producer* growing wheat on the *margin of cultivation.*

The above method of expressing the economic rent of land makes it plain that economic rent depends (*a*) on the surplus output of one piece of land over another, and (*b*) on the value of that surplus output. In the illustration it depends (*a*) on the extra cwt. of wheat per acre and (*b*) on the price per cwt. Clearly an increase in the price of wheat would increase the economic rent of both farm A and farm B. It might even induce a fourth farmer (D) to start growing wheat, though previously he would not have been justified in doing so. The moment D becomes a wheat grower, farmer C steps up from the position of marginal producer and his farm now yields an economic rent equal to the value of the surplus output of wheat per acre he can obtain from the same input as farmer D, the new marginal producer. The converse is also true, for a fall in the price of wheat would result in lower economic rents throughout. If the fall in price is sufficiently discouraging, farmer C will give up wheat production altogether since his land will become sub-marginal. Farmer B will thereupon become the marginal producer. Clearly the economic rent of land has no influence on the price of the product produced from it, for the economic rent is itself governed partly by that price. In Ricardo's famous phrase " corn is not high because a rent is paid, but a rent is paid because corn is high."

Variation in soil fertility is not, however, the only cause of economic rent. Economic rent can also result from varying degrees of proximity or of accessibility to raw materials or to markets. Indeed it is possible for the advantages of good situation and environment to outweigh the disadvantages of inferior natural fertility, while vice versa, the most fertile land may be so inaccessible as to make its cultivation uneconomic if not impracticable. This conception of an *economic rent of situation* is, of course, a reflection of differences in the costs of transporting the products of the land to market. Different costs of transport to market, in turn, are reflected in different prices for products *at the farm.* Differences in transport costs depend partly on proximity to the market and partly on the means of transport available. That is why farmers on the outskirts of towns or farmers near good rail or road communications are, other things being equal, likely to obtain higher prices for their products at the farm than farmers less advantageously situated. As in the case of variations in fertility, the advantage is fortuitous being due to conditions entirely outside the influence of the fortunate farmers concerned. The benefit it confers is, therefore, also of the same nature as the benefit conferred by superior fertility. Both participate of the character of economic rent.

It follows that as a result of variations in quality or variations in situation and environment or both, it is theoretically possible, *under any given set of economic conditions*, to divide land into the three categories of sub-marginal, marginal and super-marginal with respect to the production of any product or any particular system of farming. Land is sub-marginal for the production of a particular commodity (say wheat) when the value of the output obtained from it will not equal the costs of the inputs of labour and capital used. Marginal land for wheat production will be just worth-while using for that purpose since it will yield an output of wheat the value of which will just repay the costs of labour and capital used and give a normal rate of profit to the farmer. Super-marginal land for wheat production will yield, however, an output of wheat the value of which will exceed the costs of production, i.e. it will be more than enough to pay the wages of labour, the interest on capital and the normal profits of the farmer.

Super-marginal land only will yield an economic rent, and this will be equal to the value of the surplus output obtained over and above the output of the marginal land.

It is necessary to emphasize that the economic category of any given piece of land is not static. Indeed the terms marginal land, sub-marginal land and super-marginal land are not absolute terms. They are relative terms describing the economic suitability of any piece of land to grow particular products under any given level of cost and price. Changes in economic conditions which affect the cost levels of the inputs or the price levels of the outputs or both will affect the designation. In other words " the margin of cultivation " in respect of any product shifts if there are non-compensating changes elsewhere. The economic history of agriculture in this country provides ample illustrations of this shift. For example, at the end of last century the fall in the price of wheat transferred hundreds of farms from a marginal to a sub-marginal status so far as wheat production was concerned. Again the influence of changes in accessibility to markets on the margin is well illustrated in the development of milk production. The growth of railways and later of motor transport coupled with increasing knowledge of the means of preserving milk in transit has converted hundreds of sub-marginal farms (i.e. sub-marginal for milk production) into marginal and super-marginal farms in many regions of the country. Many other illustrations could be given.

It follows that there are two levels of efficiency for the use of land as a factor of production in agriculture. The first may be called the level of *physical efficiency* and is measured by the physical output per acre. The second may be called the level of *economic efficiency* and is measured financially in terms of the output per unit of input. It is the level of economic efficiency which is important to the farmer, for as a business man he should not exploit physical efficiency beyond the point where economic efficiency is exhausted. Many people think that the land of this country should be farmed to the limit of its physical efficiency. But from the economic point of view this is not possible since farmers can be expected to farm only so long as inputs of labour and capital are rewarded by an output which makes it worth their while financially to do so.

VALUE OF LAND

The contract rent which a tenant-farmer pays for his farm includes a payment in respect of the advantages which confer economic rent on the land concerned. In effect this means that a farmer capitalizes the *prospective* advantage of both fertility and situation in the commercial rent which he contracts to pay. Hence through having to pay a higher commercial rent the farmer may make no more profit than his neighbours even though his land may have a higher economic rent. The relation between the ordinary contract rent of farms and the economic rent of land has been stated by Marshall in the following words, " The full rent of a farm in an old country is made up of three elements : the first being due to the value of the soil as it was made by nature ; the second to improvements made in it by man ; and the third, which is often the most important of all, to the growth of a dense and rich population, and to facilities of communication by public roads, railroads, etc." The first and third elements in Marshall's definition constitute the basis of economic rent or pure rent. In practice, however, it is impossible to separate the man-made improvements since they are inextricably bound up with the land itself. In old countries like Britain it is probably true to say that the bulk of farm rents today represent " interest upon capital sunk during numerous past centuries in reclamation, improvement and maintenance." [1]

Nevertheless, in estimating what contractual rents to offer for farms, farmers subconsciously think in terms of economic rent, for considerations of situation and environment as well as what they consider the natural possibilities of the land itself obviously weigh with farmers. Other things being equal, it is easy to prove that farms near good markets are rented at higher figures than similar farms in inaccessible areas, and that higher rents are paid for "naturally good" farm land. In other words an element of economic rent, depending on the limited *supply* of different categories of land is clearly reflected in the commercial rents paid by tenant-farmers.

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[1] J. A. Venn, *The Foundations of Agricultural Economics*, p. 73

In practice, however, commercial rents in this country are mainly determined by the competition or *the demand* for farms. The demand for farms, in turn, depends on the general prospects for agriculture as compared with other activities. In other words there is a tendency for contract rents (like economic rent) to be influenced by the general level of agricultural prices, though the position is affected by many other considerations and especially by custom and tradition. During periods of agricultural prosperity rents tend to rise, though the rise lags behind the rise in prices and is never of the same dimension. On the other hand, prices of agricultural produce tend to fall much more rapidly than do rents and it is generally necessary to have a prolonged fall in prices before rents are affected. Statistical information about movements in rents for the country as a whole is not very complete, but there is sufficient to provide evidence of the general relationship with the level of prosperity of the farming industry as a whole. For example, it has been shown that the average rents of agricultural land in England and Wales dropped by 30 per cent during the depression years between 1872 and 1900.[1] Again between 1925 and 1931—another period of financial setback, especially for arable farming—the general average rent of all farms in England and Wales was officially estimated to have declined by about 10 per cent, the reduction being much greater in the main arable areas than in the districts where pasture land predominated.[2]

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[1] R. J. Thompson, "An Inquiry into the Rent of Agricultural Land in England and Wales during the Nineteenth Century" (*J. of R.S.S.*, vol. lxx, 1907)

[2] *The Agricultural Output of England and Wales, 1930–1931* (Cmd. 4605, 1934), p. 53

From the point of view of the landowner the rents he obtains represent the income he derives from the ownership of farms. But the landlord must obtain this income whether or not he farms his lands himself, though it is only called rent when the land is " let " to others. The commercial rent, or the income of ownership must be sufficient, therefore, to cover the expenses of ownership (i.e. pay for the cost of renewals and repairs and for estate management) and yield a rate of interest on the landlord's capital sufficient to induce him to invest it in agriculture. The statement that " the value of land is its rent capitalized " conveys this conception of rent as the income from investment. So also does the popular method of expressing the value or the price of land in terms of *so many years' purchase*, i.e. as the rent multiplied by the number of years concerned. In general the price of agricultural land, like its commercial rent, reflects the prosperity or otherwise of agriculture, though it is also affected by considerations of the security of the investment and the social and other amenities appertaining to its possession. This question is again discussed under the problem of land tenure (Chapter VIII).

These principles are clearly reflected in the results of a comprehensive inquiry, carried out in 1941, into the rents and rental values of all holdings above 5 acres in size in England and Wales.[1] The inquiry established that the average rental value of such holdings was approximately 27/- per acre of cultivated land, i.e. land in crops and grass, or 24/- per acre when rough grazings were included. But this average covered a wide range of rental values, the more important factors responsible for the range being size of holdings, quality of land and buildings, geographical situation and type of farming.

Thus small farms generally had higher rentals than large farms, the range being from 52/- per acre for holdings under 25 acres in size to 19/- per acre for those over 700 acres in size. This is explained partly by the higher incidence of the farmhouse and buildings on smaller farms, partly by the tendency for a higher proportion of small farms to be on better land or in the neighbourhood of towns and partly because of a somewhat brisker demand for small than for very large farms.

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[1] *National Farm Survey of England and Wales*, pp. 23-31

The counties with the highest average rentals per acre were those recognized as having the richest agricultural soils, while the counties with poor agricultural soils were found at the other extreme. The two counties with the highest average rent per acre were the Holland division of Lincolnshire (59/- per acre) and the Isle of Ely (46/- per acre). Middlesex came next with 41/- per acre, although here " the high figure is probably due as much to the all-pervasive influence of London as to the natural productivity of the soil." At the other extreme came Merioneth (7/- per acre) and Cardigan (10/- per acre).

Finally, holdings concerned with pasture types of farming, with an average of 29/- per acre, were more highly rented than holdings of the intermediate (mixed) and arable types which showed an average rent per acre of 25/- and 27/- respectively. Smaller holdings devoted to the intensive production of high quality products, with easy access to large urban markets, had considerably higher average rents than remote areas of extensive farming identified mainly with corn and sheep.

From the agricultural standpoint in this country today it is more realistic to talk about the rent or price of farms rather than of land. This is because it is the farm with its full equipment of land, buildings, hedges, roads, etc. which is the commercial unit on which rents and prices are calculated even though the rents and the prices themselves may be quoted as so much per acre. It is necessary to bear this in mind in interpreting the average per acre figures just given, for they do give point to the contention that it is not possible in practice to distinguish between the land itself and the capital equipment incorporated in it. Taking the whole farm as the unit, the 1941 inquiry established that 40 per cent of the holdings of 5 acres and above had a total rental value of less than £50 per holding, nearly two-thirds were rented at no more than £100, while less than 2 per cent had a total rental value of over £500 per farm.

CHAPTER IV

CAPITAL AS A FACTOR OF PRODUCTION

THE broad distinction between land and capital as two separate factors of production is that land consists of those goods which are given by nature while capital consists of those goods made by man. From the point of view of agricultural economics there are two significant contrasts between land and capital. The first is that the supply of land is fixed by nature while the supply of capital can be added to and, indeed, is dependent upon the action of man. The second contrast is that agricultural land is virtually indestructible if properly looked after, while capital goods, however carefully used, are subject to depreciation, that is, they wear out in time and need repairing and eventually replacing.

Capital and money are often confused in everyday speech. But from the economic aspect it is important to distinguish between them, for money is only the symbol of capital. It is not necessarily the capital itself. For example, a farmer's capital is usually expressed in terms of pounds, shillings and pence, but the actual farming capital at any time consists of the apparatus of production, i.e. the farm and its buildings, machinery, livestock, crops, stores of materials and ready cash. Every farmer observes this distinction each time he makes his annual valuation, for making the valuation is really two processes, viz. (*a*) making an inventory of everything on the farm (i.e. making a list of the capital goods), and (*b*) putting a value or price on those goods (i.e. expressing them in terms of money). In considering the economics of production it is important to bear this distinction in mind, though in considering the financing of farming it may be convenient to use the popular meaning of capital as the funds necessary to buy or rent a farm, to buy livestock and equipment and to pay wages and other expenses while awaiting the returns from the investment.

CLASSIFICATION OF FARMING CAPITAL

It is usual to divide capital goods into the two main classes of *fixed or permanent capital* and *circulating or working capital*. The first class includes those capital goods such as buildings and machinery which do not wear out quickly and which can be used time and again without their utility being seriously affected. The capital goods in the second class, on the other hand, can be used only once because they are " consumed " in a single process of production, e.g. seed for sowing, food for livestock, money to pay wages, etc. It is not easy to decide in which of these two categories to place many items of farming capital especially livestock. For example, livestock used for breeding or for the production of commodities such as milk or eggs or wool might be classed as permanent capital ; but if the livestock themselves are being prepared for market they should be classed as circulating capital. The difficulty is overcome by adopting a more realistic classification of the capital goods used in farming into three groups as follows : (*a*) equipment, (*b*) livestock and growing crops, (*c*) requisites or materials.

(*a*) *Equipment* consists of those " permanent " capital goods which help labour in production. Farm equipment may be sub-divided into two groups, viz. (1) " immovable " equipment such as buildings, fences, drains, roads, etc., i.e. those items of permanent capital which in this country are described as landlord's capital ; (2) " movable " equipment such as implements, machinery and tools, i.e. those items of permanent capital which in this country are always supplied by the farmer himself whether he owns or rents his farm.

It is the function of equipment to assist labour and in this sense its productivity is indirect and is measured by what it adds to the efficiency of labour. Equipment makes this contribution in many ways some of the more important of which are as follows : (1) it may enable labour to make better use of the land itself, e.g. drainage ; (2) it may make for increased output through enabling vital tasks to be carried out at critical phases, e.g. cultivating and harvesting machines ; (3) it may help to protect produce, e.g barns for both crops and livestock ; (4) it may make possible the production of superior products, e.g. sterilizing equipment on a dairy farm ; (5) it may increase labour efficiency through lessening fatigue and boredom, e.g. electrical equipment and labour-saving devices generally.

In assessing the productivity of capital invested in farm equipment it is necessary to consider the expenses of the equipment itself—the chief elements of which (apart from the initial investment) are depreciation, or wear and tear and the costs of repairs and renewals. Moreover, a piece of equipment may become valueless to a farmer before it is worn out if it becomes redundant through a change in the farming system, or if it becomes obsolescent through being superseded by a better type of equipment. For example, many good farm buildings in this country are of little use for present-day farming ; good centrifugal separators were scrapped by hundreds of west-country farmers when they turned over to liquid milk selling ; when corn-binders were introduced on the arable farms of the Eastern Counties they rendered the existing reaping machines obsolete and practically worthless.

Another factor of great importance in determining the productivity of farm equipment is the seasonal nature of farming processes which makes it impossible to use many types of relatively expensive equipment except for a short period of time each year. This is notably true of cultivating and harvesting machinery which can only be used for a limited number of days each season. This means that quite substantial amounts of capital may be locked up in units which lie idle for the greater part of the year. The danger of over-capitalization in such machines must therefore be guarded against by ensuring that they are only invested in where there is a fair prospect of providing optimum use. For example, a farmer with only 25 acres of corn would not be justified in purchasing a combine-harvester under present conditions. It will be necessary to return to this question of maximum utilization of potential capacity in dealing with the efficiency of labour itself as well as in dealing with the problem of management and the size of farms.

(*b*) *Livestock and growing crops* differ from both equipment and requisites in that they are living things. They can be subdivided, according to the function they perform, into the three categories of *work-stock*, *productive-stock* and *stock in process*. *Work-stock* in this country is practically limited to horses. *Productive-stock* includes (*a*) breeding stock kept for their progeny, e.g. ewe flocks kept to produce lambs; (*b*) livestock kept to produce commodities such as milk, eggs, wool, etc.; (*c*) perennial crops yielding more than one harvest, e.g. grass, fruit trees, etc. *Stock in process* includes all annual crops as well as all livestock which are themselves being prepared for market.

In a sense both the work-stock and the productive-stock may be regarded as part of the equipment of the farm. But being living things they differ from the inanimate equipment in two respects. Firstly, they differ in the incidence of depreciation, for, during a period of their life-cycle, they are subject not to physical deterioration but to physical appreciation. For example, a young work-horse increases in efficiency for several years after breaking-in, a heifer increases in her productivity for two or three lactations after the first, a plantation of standard fruit trees comes into production about the seventh year but its output should increase each year afterwards for upwards of ten years or more before reaching its maximum yield. Secondly, in the case of most livestock equipment it is possible to dispose of it as produce as soon as depreciation sets in. But any advantage which animate equipment may possess in this respect is largely offset by the much higher degree of risk to which living things are exposed. All livestock and crops are liable to serious set-backs and even death not only from accidents but more particularly from weather, disease or pests. The incidence of some of the more severe of these risks can be shifted by insurance, though so far not much use has been made of this in Britain.

(c) *Requisites or materials* include most of the things, other than livestock and crops, generally classed as circulating or working capital, i.e. the inanimate things which can be used only once because they are absorbed or consumed in a single production process, such as food for livestock, manures, fuel and a variety of miscellaneous items.

CAPITAL INVESTED IN BRITISH AGRICULTURE

In this country the conventional classification of farming capital is that which conforms to the prevailing system of land-tenure and divides capital into *landlord's capital* and *tenant's capital*. Landlord's capital includes the farm itself with its buildings, roads, fences, gates, drains and other fixed or immovable equipment; tenant's capital includes the machinery and implements, livestock and crops, stores and ready money for day to day transactions.

Unfortunately there is no recent estimate of the total capital invested in British agriculture and, indeed, it is no easy matter to make such an estimate. Lord Stamp [1] estimated the total "industrial capital" of the country in 1928 at £10,020 million, of which agriculture accounted for £1,400 million or 14 per cent. This compared with £860 million or 8·6 per cent invested in British railways. Figures such as these leave little doubt about the relative importance of the agricultural industry in the national economy.

In a later estimate [2] for 1931 the Ministry of Agriculture calculated the total capital invested in agriculture in England and Wales at £925 million, of which approximately two-thirds (£645 million) represented landlord's capital and approximately one-third (£280 million) represented tenant's capital. These figures illustrate one important feature of investment in agriculture, viz. the relatively high ratio of permanent to working capital—working or tenant's capital being less than half the value of the permanent capital as represented by the landlord's investment.

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[1] Sir Josiah Stamp, *The National Capital and Other Statistical Studies* (London 1937), p 234

[2] *The Agricultural Output of England and Wales, 1930–1931* (Cmd. 4605, 1934), p. 50

Another characteristic of agricultural investment is the relatively high amount of capital required per worker, especially when it is remembered that agriculture is not a highly mechanized industry. Thus it has been estimated that the average capital used per worker in this country in 1928–30 was £1,370 in agriculture as compared with only £430 in other industries.[1]

On the other hand, the amount of capital per business unit is much less in agriculture than in any other producing industry. This reflects, of course, the dominance of the small-scale family business in agriculture while most other industries are organized in large-scale joint-stock companies. In pre-1939 values a very rough average of the capital required for farming was £45 per acre—£30 per acre for land, buildings, etc., and £15 per acre for stocking and working capital. On an ordinary mixed farm of 150 acres this would amount to a total investment of roughly £6,750, of which £4,500 would be landlord's capital and £2,250 would be tenant's capital. But general figures of this nature cover a very big range of requirements, for the amount of capital invested per farm varies widely according to several factors of which the more important are size of farm and type or system of farming.

Some indication of the influence of these factors on the amount of landlord's capital has already been given in the previous chapter, for rents per acre and per farm reflect the investment in land and buildings.

Variations in the amount of tenant's capital are even more pronounced. For example, in the 1930s, at one extreme, the capital invested per acre in a group of intensive Lancashire poultry farms was just over £100, while, at the other extreme, in a group of Welsh cattle and sheep farms on poor land the capital invested was under £3 10/- per acre.

The figures in Table IV give an indication of the variations in capital investment on farms in England in 1938. The figures are extracted from a report on the financial transactions of farming based on data collected by the Agricultural Economics Departments of the Universities and Colleges.[1] The figures show the value of the capital invested in livestock, in crops and in implements and machinery , they do not include capital used for current requisites, payments of wages, etc. Capital investment in livestock, crops and machinery amounted to between £10 and £14 per acre[2] in twelve of the twenty-one groups shown in the table. The range was from £9 7/- per acre for grassland farms in north Bucks and in south Northumberland to £23 8/- per acre for the arable farms on the Lindsey-Yorkshire warp lands.

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[1] R. L. Cohen, *The Economics of Agriculture*, p. 61

In seven of the first eight areas listed in Table IV (i.e. those in the grassland farming groups) livestock accounted for over 70 per cent of the capital investment concerned. On the other hand, seven of the last eight areas listed in the table (i.e. those in the arable farming groups) had over 50 per cent of their capital in crops. The highest investment in implements and machinery was on the intensive dairy farms of south-west Cheshire (£3 10/- per acre), and on the arable farms on the warp lands of Lincolnshire and Yorkshire (£3 3/- per acre). On fifteen of the twenty-one groups of farms concerned implements and machinery accounted for over 15 per cent of the tenant's capital. These figures apply to conditions in 1938, but since then there has been an appreciable increase in mechanization in most types of farming, and this has had the effect of raising both absolutely and relatively the amount of capital invested in implements and machines.

The range in the total investment per farm is greater even than the range in the investment per acre. Thus the largest farm businesses in terms of capital per farm are shown to be the arable farms on the chalk-lands of Wiltshire, Dorset and

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[1] *Farm Management Survey Scheme*, Report No. 2, Year 1938. Issued by the Agricultural Economics Research Institute, Oxford

[2] The figures are given per 'adjusted' acre, i.e. rough grazings have been converted to their equivalent in terms of average pasture.

Hampshire. On the other hand, the smallest farm businesses in terms of capital are shown to be the grassland dairy farms of the Severn valley.

It has already been stated that the figures in the table are exclusive of capital invested in stores and requisites. It is also necessary to state that the figures shown, like all figures purporting to assess the tenant's capital in farming, are subject to certain limitations due to the difficulties which are inherent in any such assessment. Two of these difficulties are particularly important. In the first place the calculation will depend upon the time of year in which it is made. But the value of the capital investment in a farm will vary considerably from season to season depending on the numbers and stage of maturity of the livestock, on the stage of development of the growing crops, on the amount of produce and stores in hand and so forth. Secondly, the calculation will also depend, of course, on the basis of valuation adopted. In so far as the object of the valuation is to assess the capital investment, the basis should be as near as possible to the current market prices of the goods valued. But there are so many modifications practised that, as already stated, it is necessary to accept any estimate of the value of farming capital with considerable reserve.

The Financing of Agriculture

The problem of agricultural finance is concerned with the ways and means whereby farmers obtain the necessary funds for procuring the capital goods and services which they use on their farms.

In Britain in the past the traditional system of the large landed estate has had an important bearing on the financing of the agricultural industry. Under this system of land tenure the permanent capital in the form of the farm itself with its fields, steading and fixed equipment is supplied by the landlord who hires it out to the tenant-farmer for a money rent. The bulk of this landlord's capital was initially invested in farming during the first half of the nineteenth century when

TABLE IV—Capital in Livestock, Crops and Machinery on 959 English Farms in 1938

Type of Farm	No. of Farms	Capital per adjusted acre in						Total		Capital per Farm
		Livestock		Crops		Machinery				
		£	s	£	s	£	s	£	s	£
Grassland dairying										
S. Essex	50	5	5	2	19	1	18	10	2	1,642
S. W. Cheshire	45	11	10	1	8	3	10	16	8	2,708
S. Derby – E. Staffs	39	9	5	1	2	2	1	12	8	2,271
Wiltshire	63	7	14	1	5	2	4	11	3	2,297
Grassland dairying and mixed										
N. Salop	40	12	4	2	1	2	13	16	18	3,110
N. Bucks	32	6	14	0	19	1	14	9	7	1,737
Severn Valley	25	7	16	1	0	2	0	10	16	1,304
Grassland mixed livestock										
S. Northumberland	31	7	7	0	16	1	4	9	7	2,949
Mixed farming with substantial dairying										
E. Durham	60	5	16	5	5	2	10	13	11	2,373
Solway Plain	58	9	14	3	8	1	19	15	1	2,346
Cotswolds	37	6	9	2	7	2	5	11	1	3,150
Corn, sheep and dairying										
Wiltshire chalk	30	5	8	2	11	1	15	9	14	6,037
Hants & Dorset chalk	44	4	9	4	10	1	15	10	14	5,898
Heavy land arable										
N. Essex	50	2	6	6	14	1	15	10	15	1,789
Light land arable										
S. Cambridgeshire	50	3	8	7	6	2	4	12	18	2,330
Notts sand	38	4	14	5	9	1	12	11	15	2,339
Lincoln limestone	62	4	18	8	15	1	14	15	7	4,171
Lindsey wolds	60	4	8	7	6	1	6	13	0	5,158
Arable and mixed farming with alluvial arable										
Central Norfolk	50	4	1	6	13	1	15	12	9	1,553
Lindsey-Yorks warp	39	4	14	15	11	3	3	23	8	3,644
Vale of York	56	5	8	7	12	2	8	15	8	3,287

the majority of the farms of the country were laid out and equipped. The original landlords were usually men of substantial financial means, and the capital which they invested in their estates was derived from many sources. Much of it was inherited wealth and much of it was obtained from profits made in commerce, in urban industries and in the professions. This permanent capital was maintained partly from rents and partly also from the landlord's investments in non-farming activities. In this connection it is important to remember that, in the past, financial considerations were not the only ones which weighed with the landowners in making their agricultural investments. Thus many landlords invested capital in landed estates in order to become "country gentlemen," i.e. they were willing to invest capital in land regardless of the actual monetary returns in order to enjoy the social and other privileges conferred by the ownership of large landed estates. Again many landlords in times of economic and financial insecurity attached great value to the comparative permanency of land as an asset, a value which outweighed any disadvantage in the comparatively low monetary returns which investment in land might entail. The tendency during this century for the disintegration of the system of big estates which is discussed in Chapter VIII has profoundly affected the supply and maintenance of the permanent capital resources of the industry.

Farmers, whether they own or rent their farms, obtain their working capital in one of three ways, viz. by inheritance, by saving or by borrowing. It is here that agriculture is sharply distinguished from other industries most of which, as already stated, are financed on the joint-stock principle. But the bulk of the farm businesses of the country (and this applies also to the large landed estate) are family concerns financed from the private resources of the farmers themselves. A recent rough classification of the occupiers of farms in England and Wales according to their legal business status revealed that less than 11 per cent were private partnerships or joint-stock companies. There has been an appreciable increase in recent years in farming partnerships, but most of these have been family partnerships designed in the main to meet the changed conditions of farmers with respect to income tax assessment and having little if any relation to the method of financing the farm business as such. Little is known about the relatively small number of joint-stock companies, but many of them are associated with an industrial business in some way or other, e.g. some jam manufacturers grow their own fruit, some manufacturers of potato products grow their own potatoes and some bacon curers produce their own pigs. Although these exceptions exist the arresting fact is that joint-stock is hardly met with in agriculture.

The joint-stock company is a legal arrangement whereby the company obtains its capital by collecting the small capitals or savings of its shareholders ; its distinctive economic feature is the divorce of the ownership of the capital from its use. In the farm business, on the other hand, the farmer himself is also the investor and the risk bearer, and there is no " dissociation of ownership and control of farming capital from the management."[1] All kinds of important consequences result from the absence of this form of division of function within the agricultural industry.

In the first place the fact that farming is conducted by private individuals handling their own capital means that agriculture is virtually a closed industry to persons who have not the necessary financial resources to enter the industry. This means that the effective qualification for becoming a farmer or an agricultural landlord is the possession of the necessary capital. Competence to run a farm or competence to manage landed estates is of secondary consideration.

Another important economic consequence of family finance in agriculture is that the capitalization of the industry is determined not so much by its capital requirements as by the capital resources of the individual landlords and farmers who finance it. This can, and does, result in a maldistribution of the capital resources of the industry, resulting in some farms and estates being over-capitalized while others are seriously under-capitalized.

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[1] J. P. Maxton, *Manpower in Agriculture*, p. 11

As already stated the capital resources of individual farmers depend partly on inheritance and partly on savings. It is probable that the greater part of the capital used by any generation of farmers has been inherited by sons who have taken over their fathers' farms. But the death of a farmer invariably affects the continuity of the capital invested in any given farm business even when son succeeds father. The ability of farmers themselves to save and thereby add to the capital invested in their farm businesses depends in large measure on their business ability and on their standards of living. The fact that farm families can to a considerable extent adopt standards of living requiring little cash expenditure makes it possible to start farming with little capital and, by thrift and frugality, gradually increase its supply. While there may be important social and political arguments in favour of this personal basis of farming capital, from the economic point of view the set-backs to which it is subject are not conducive to a rate of capital formation in keeping with a progressive and forward-looking industry.

Farmers, like other business men, do not themselves possess all the necessary funds to bridge the gap which must elapse between expenses and receipts. They obtain the extra funds by borrowing them from others and paying interest on the loan. This is the method of credit. It is possible that agriculture gave birth to the conception of credit for the "interval between seed time and harvest, between the rearing and killing of beasts, probably necessitated in the earliest times the use of some system of credit." [1] In this country today, however, the credit needs of non-farming industries and trades are better served than are the credit needs of agriculture itself because the modern machinery of borrowing and lending is designed primarily to meet the needs of the joint-stock form of business organization. Moreover, there are at least three important characteristics of farming which have a special bearing on its credit position. The first is the nature of farming risks, the second is the nature of farming turnover and the third is inherent in family finance.

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[1] *Report of Committee on Agricultural Credit* (Cmd. 1810, 1923), p. 3

In order to make lending and borrowing a perfectly sound business proposition it is necessary for both the lender and the borrower to be reasonably sure that they will stand to gain from the transaction. But to ascertain this for agricultural loans presents special difficulties. The lender, on his part, must have some assurance that the borrower will repay the loan with interest and asks therefore for some tangible security for his loan. But the farmer's most important tangible assets —his livestock and his crops—are not rated highly as security because, being living things, they are subject to a special degree of risk. Likewise the farmer-borrower has special difficulties in estimating whether the use he can make of the loan will justify the cost of borrowing. This again is because agriculture " is at all times beset with risks from which most other productive industries are relatively free, and this element of risk makes the ordinary methods of forecasting earnings inapplicable to farming." [1] For example, a farmer who wants to borrow in the autumn in order to be able to sow his wheat will have to wait till after harvest before he gets a return from his loan. Meanwhile, he has to run the physical risks of wheat production which, without considering any economic risk from changes in price-levels, may upset the most careful forecast he may have made of the productivity or profitability of the loan.

The natural processes of growth on which farming depends cause farm production to proceed in cycles, whereas in most other industries production is a continuous process. Moreover, the farmer himself can do little to control the length of the cycles, for he cannot speed up the growth of crops or of livestock. This dominance of the time factor results in a relatively slow rate of turnover for farming. This slow rate of turnover means that farmers generally want to borrow

[1] Ministry of Agriculture and Fisheries Economic Series, No. 8, 1926, p. 14

relatively small sums of money for relatively long periods of time. But the credit and banking system of the country, on the other hand, is mainly interested in the more profitable business of lending relatively large sums of money for relatively short periods of time. In other words, other things being equal, a quick turnover is more profitable in the business of supplying credit just as it is in other spheres of economic activity.

Lastly, the psychology of family finance and the inherent conservatism of farmers in money matters are potent factors in the situation. This is manifested in a general mistrust of borrowing and in a tendency to regard borrowing as being synonymous with running into debt. This is only another way of saying that farmers as a class do not regard the use of credit as a legitimate business means for implementing the planned investment of their farms. Indeed, all too often farmers borrow only in order to relieve immediate stresses and thus, in fact, they give point to their general belief that borrowing means getting into financial difficulties. In this connection the fusion of family and business matters on the family farm is a serious contributing factor, since the use of credit for purposes of farm production and for purposes of family consumption are often not clearly defined or separated. The position is further aggravated by the general reluctance of farmers in this country to disclose to others any details of their financial standing, thus making it impossible to attain that basis of confidence which is essential for the working of any sound credit organization.

The financing of agriculture is, therefore, the problem of financing small family businesses offering peculiar risks and only limited financial returns. It has been stated that the success of " family finance " in farming depends to a considerable extent on " there being an adequate agricultural substitute for the industrial joint-stock method of obtaining working as well as initial capital. This is the problem of agricultural credit." [1] In considering the problem it is necessary to stress the contrast which exists between agriculture's need for long-term and for short-term credit respectively.

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[1] *Agricultural Tribunal of Investigation, Report of D. H. Macgregor* (Cmd. 2145, 1924), p. 104

Long-term Credit

The distinguishing feature of long-term credit in agriculture is that loans are given on *mortgage security*, i.e the land or real property is taken as security for loans. Long-term or mortgage credit can only be obtained therefore by the owners of farms. and a consideration of it belongs largely to the question of land tenure. Long-term credit may be required for one of two purposes. First, it may be required for the purpose of financing the purchase of farms. Secondly, long-term credit may be required for the purpose of financing the upkeep or the subsequent improvement or modernization of existing permanent equipment or for the erection of new permanent equipment.

The first purpose has become important in this country only in recent years, and this has been the result of the disintegration of the large-estate system with the consequent tendency for an increase in the number of owner-farmers. Thus occupying owners now farm 37 per cent of the total farms as against only 10 per cent in 1914.[1] The new owner-farmers have had to find the capital for long-term investment previously supplied by the landlord class. Although statistical evidence is almost completely absent, it is highly probable that only a small proportion of the new owners were able to finance the purchase of their farms from their own resources.

Secondly, the need for credit to finance the upkeep and improvement of existing equipment has also increased in significance in recent years. This is partly due to the inability of the landlords to undertake the expense of estate upkeep with the consequent mounting of arrears of repairs and dilapidations. It is also partly the result of the obsolescence of much of the permanent equipment of farms. This is not surprising when it is remembered that comparatively few of the country's farmsteads are less than 100 years old. Moreover, the rapid changes in farming systems during recent years have increased the urgency to re-equip and to rearrange both fields and buildings. In this connection the need for long-term investment to enable farmers to take full advantage of technical developments in grassland management, in dairying and in mechanized crop production has become increasingly insistent.

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[1] See p. 164

Farmer-owners in this country can obtain mortgage credit from each of three sources, viz. (*a*) private individuals, (*b*) the joint-stock banks, and (*c*) special agricultural credit institutions.

Private borrowing from relatives or through solicitors or trades-people is very prevalent though there is no means of measuring its real extent. Private loans are often convenient and also often undoubtedly adequate, but they suffer from at least three disadvantages. In the first place the conveyancing costs are generally high. Secondly, they are not usually repayable in regular and easy instalments. Thirdly, they are always liable to be foreclosed at short notice and thereby cause considerable inconvenience if not embarrassment to the borrower.

The joint-stock banks, while they do undertake mortgage lending, prefer to keep their resources more liquid. They are, however, generally prepared to negotiate private mortgages between clients. The nature of bank loans is such that they fall into a position intermediate between the private loan and advances from government sponsored lending institutions. Whereas the former type of loan is generally repaid as a whole, and in the latter type amortization is by fixed instalments, the bank loan has a degree of flexibility which is highly advantageous to the borrower. In other words repayment of the bank loan can be made intermittently and at a rate which the fortunes of the borrower may determine. The usual practice is for the bank to grant a credit up to a certain maximum upon which the borrower can draw. Interest is calculated on the amount actually drawn, so that when crops or livestock are sold and the proceeds paid into the bank, even if it remains there only temporarily, the loan is reduced for the time being and the interest charge falls correspondingly. In this way the borrower by a continuous process of paying in more than is drawn will eventually liquidate the loan. Meanwhile he has paid interest only on the fluctuating amount drawn and not on a fixed constant loan.

In addition to the above general sources of loans there are two institutions in this country which cater specifically for long-term credit for agriculturists. These are *The Lands Improvement Company* and *The Agricultural Mortgage Corporation Limited.*

The Lands Improvement Company, originally founded in 1853, has absorbed the other statutory companies formed in the last century and incorporated under various Improvement of Lands Acts passed between 1849 and 1920. These acts empowered landowners to borrow money at a moderate rate of interest for permanent improvements on the security of a rent charge upon the land itself. Consequently the company advances loans for long-term improvements only; it does not deal with loans for the purchase of farms. It obtains its funds by borrowing from insurance companies, and re-loans these funds to the owners of agricultural property for the improvement of their farms. Loans are made on the security of a rent charge and are repayable as an annuity extending over a period not exceeding 40 years. All loans must be sanctioned by the Ministry of Agriculture, and the Ministry is under a statutory obligation to ascertain that the proposed improvement for which the loans are to be used will yield a return in the increased yearly value of the land greater than the amount of the annual rent to be charged. So far the company has advanced over £15 million to the owners of agricultural property for the following among other purposes: erection of and additions to farmhouses, buildings and cottages; water supplies; drainage; fencing; roads; lighting installations, etc.

The Agricultural Mortgage Corporation Limited is constituted under the provisions of The Agricultural Credits Acts of 1928 and 1932. The Act of 1928 was largely based on the report [1] of an inquiry carried out in 1923 by the Ministry of Agriculture into the whole question of agricultural credit in this country. The Act was in two parts, the second part dealt with short-term credit while the first part, dealing with long-term credit, made possible the establishment of the corporation in January 1929. An analogous body, *The Scottish Agricultural Securities Corporation Limited*, was set up for Scotland in 1933. The main objective of these bodies is to supply a uniform standard system of long-term mortgage credit for agriculture.

The funds of The Agricultural Mortgage Corporation are derived from three sources, viz. (1) a Government loan supplemented by an annual contribution towards administrative expenses, (2) share-capital held by the joint-stock banks, (3) debenture shares issued to the public in the open market and ranking as full trustee security. The debenture shares in particular constitute a standard agricultural investment and open up a new recognized channel through which capital can enter the agricultural industry.

The corporation is empowered to grant long-term loans on the security of properties for the purchase of farms, for the discharge of existing mortgages and for major improvements. It has no power to grant loans on the security of crops and of livestock. The following list of the purposes for which improvement loans may be granted covers most of the main requirements of agriculture for long-term capital and credit : (1) erection, replacement and reconstruction of farm buildings ; (2) drainage, including pipe drainage and mole drainage, and the straightening, widening or deepening of drains, streams and water-courses ; (3) provision of essential water-supply ; (4) provision of fencing essential for proper management ; (5) making of farm roads and farm bridges, and (6) irrigation, warping and reclamation of agricultural land.

The loans made by the corporation must not exceed two-thirds of the estimated value of the land on the security of which they are made. They are repayable by equal half-yearly instalments spread over a period not exceeding sixty years, the instalments covering interest on the loan and repayment of the amount borrowed in the term of years arranged.

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[1] Ministry of Agriculture and Fisheries Economic Series, No. 8, 1926

The attraction of the loans is that the borrower has the advantage of knowing that so long as he cultivates his land adequately, pays his half-yearly instalments and observes the Covenants of the Mortgage Deed his loan cannot be called up or in any way disturbed. Though the borrower is not entitled to repay his loan otherwise than by means of the half-yearly instalments arranged, the corporation is prepared to consider earlier repayment on terms to be fixed at the time it is desired to make repayment.

An important feature of the corporation is that it is owned and controlled by the Bank of England and the joint-stock banks. Its directors represent the government, banking and financial interests, insurance and trust companies and the farming industry. All business is transacted through the joint-stock banks and their branches so that no special administrative machinery has been necessary. The procedure for obtaining a loan is straightforward and simple. The borrower makes application to his local bank just as he would if he wanted an ordinary loan. Particulars of the application are then sent on a special form to the corporation, who instruct their inspector to make a valuation of the property and advise on the terms on which the loan should be made. The local bank manager then concludes the transaction with his client, who pays his half-yearly instalment through his local bank. The whole business is secret, easy and cheap, the only fee being for the valuation and stamp duty.[1]

Up to 1943 the corporation had advanced in aggregate over £14 million to the agricultural industry. But it has had a somewhat difficult financial history since the bulk of its early resources were raised on onerous terms during the dear money period between 1929 and 1932. The Government, however, has increased its financial assistance to the corporation in order to enable it to lend at low rates of interest. At the present time this Government subvention enables the corporation to make loans at 3½ per cent—a rate well below the competitive market price for long-term agricultural mortgage loans.

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[1] A brief pamphlet outlining the procedure for obtaining loans can be obtained free on application to the Secretary, Agricultural Mortgage Corporation, Ltd, Stone House, Bishopsgate, London, E.C.2.

Short-term Credit

While long-term credit is a matter for the farmer as owner of his farm, short-term credit concerns him as "farm-operator," to use a useful term current in American economic writings. The two types of credit differ not only in the length of the period of the loan, but also in the nature of the security used, for short-term loans are not normally made on the security of real property.

The farmer may require short-term credit to finance any or all of the following: (*a*) to pay wages and other current farm and household expenses during months when there is little or no income forthcoming from the sale of produce; (*b*) to pay the half-yearly rent instalments; (*c*) to purchase certain seasonal requirements such as seeds and manures for crop production or store beasts for livestock production; (*d*) to hold crops or livestock until the most opportune time to sell; (*e*) to buy replacements of livestock or equipment, e.g. a new bull for the dairy herd or a new tractor for a scrapped one, and (*f*) to buy extra livestock or equipment for the purpose of extending or improving production, e.g. to increase the number of his dairy herd or to instal a milking machine.

It is obvious that the length of the loans needed may differ considerably for these various purposes, and a distinction is sometimes made by using the term *intermediate loans* for loans of more than a year's duration. Intermediate loans are mainly for the purpose of financing the purchase of equipment in the form of machinery or of livestock where the livestock is to be kept for upwards of twelve months.

The need for short-term credit proper will depend to a considerable degree on the type of farming. It will be less urgent on those farms where receipts are fairly evenly spread throughout the year and with no marked peaks of expenditure. Certain types of grassland milk-selling farms with regular monthly milk cheques come nearest to this ideal in this country. On other farms, however, the principal sales of produce occur at definite periods of the year and there are months during which there is nothing to sell and there are no receipts. On such farms the need for short-term credit facilities is more or less a constant feature.

Farmers in this country obtain short-term credit from many sources, but the most important are agricultural traders and the joint-stock banks. Other sources are friends and relatives, and the landlords who may grant a temporary respite to their tenants when rents fall due in difficult seasons.

Borrowing from traders—corn merchants, seedsmen, feeding-stuffs and manure merchants, implement dealers, auctioneers, cattle dealers, etc.—is a traditional and widespread practice amongst farmers. Thus it is common for farmers to obtain store cattle or seed, and to defer payment until the fat cattle are sold or the crop is harvested. This method of borrowing has certain advantages. The merits for the farmer are the ease of approach, the absence of all formalities and the convenience of being able to borrow when he really needs and for roughly the time he needs. The lender, on the other hand, is often in an exceptionally favourable position to assess the solvency of the borrower, while the fact that the loan is made in kind ensures that it will be used for a known and specific purpose. There are, however, at least two serious disadvantages attached to merchant credit. The first is that the cost of borrowing is rarely known, for it is not usual for traders to state the rate of interest charged. Secondly, borrowing from traders is often accompanied by conditions, stated or implied, which seriously limit the farmer's freedom of buying and selling in a market of his own choice and at his own time. In recent years the methods of hire-purchase as practised for domestic and other supplies has been increasingly applied to the purchase of farm requirements also. Under the best of these methods the farmer, purchasing goods on a credit basis from the dealer or the merchant, enters into a contract with regard to the price, the interest rate and the future disposal of the goods purchased.

Bank credit, the cost of which is known and which allows the borrower complete freedom to use the loan as he thinks best, is theoretically a much more business-like method of borrowing. Short-term accommodation from banks is available to farmers, as to others, in the form of overdrafts or formal loans. When the credit needs of the farmer are of a regular seasonal nature as, for example, on corn-producing farms, the method of the overdraft is often cheaper than the formal loan. Both overdrafts and loans are made on the bank manager's assessment of the credit-worthiness of the borrower based mainly on personal knowledge of him. Farmers of good standing find little difficulty in obtaining credit from banks usually on their personal reputation alone. But often the bank manager may wish to back his judgment by information from the farmer's balance sheet, or he may require the deposit of some form of collateral security such as bonds, mortgage deeds or insurance policies.

But the peculiar nature of farming risks together with the scarcity of intelligent accounting amongst farmers often makes it difficult for the banks to gauge the financial prospects of any specific loan for purely farming purposes. Moreover, up to 1928 the banks in this country would not accept the farmer's principal farming assets—his crops and his livestock—as collateral security for loans. The farmer who had no other security to offer was therefore at a great disadvantage. Indeed he could only obtain a loan from the bank by means of the *bill of sale*. The bill of sale has to be accompanied by an inventory of the chattels over which the bill is held, and has to be attested by one or more witnesses. It has also to be publicly registered, and an account of it may be published in the press. The publicity attached to this bill of sale makes it very distasteful to farmers, and it is hardly ever used.

The second part of the Agricultural Credits Act, 1928, aimed at improving the position of farmers in borrowing from the banks. This it did by instituting the principle of *chattel mortgage,* i.e. by making it possible for farmers to borrow from the banks on the security of their crops and livestock. This chattel mortgage enables the banks to secure themselves by taking a suitable charge on agricultural wealth. This charge may either be a fixed charge on certain farm assets, or it may be a floating charge on all the assets of the farm. The " agricultural charge " does not impinge in any way on the farmer's complete freedom to use and dispose, as he thinks fit, of the assets on which it is secured, provided only that the amount he receives on the sale of such assets is paid over to the bank. Should a farmer-borrower become bankrupt the bank has prior claim upon the farmer's assets (after rent, rates and taxes are paid), i.e. the bank's claim comes before the claims of all other creditors. Finally the agricultural charge has to be entered in a central register which is open to inspection, though it is illegal to publish any list of such charges or the names of farmers who have incurred them.

The institution of chattel mortgage introduced an entirely new relationship between the banks and their farmer customers in this country. The intention was undoubtedly good, for the framers of the Act aimed at discouraging merchant credit by making the banks the only source of short-term credit for the farmer. But the introduction of chattel mortgage has not met with much success. Indeed there is reason for thinking that the initiative for using the agricultural charge has generally come from the banks who have resorted to it more to secure existing overdrafts than to cover new loans. The farmers themselves have never taken to the scheme, primarily because of the condition that the agricultural charge must be entered in a central register which is open to inspection. In other words the British farmer's inherent distaste for any publicity in his financial transactions has been the real obstacle.

This secretive aspect of farmers in financial matters also accounts partly for the fact that in this country all attempts to provide credit on a co-operative basis have so far failed. This is in contrast to many countries abroad where co-operative credit organizations serving the special needs of farmers are an important feature of the financial structure of agriculture. Most of these organizations are modelled on the two original institutions set up in Germany towards the end of last century —the *Landschaften system* for long-term credit and the *Raiffeisen system* for short-term credit. These co-operative associations draw their loanable capital either from the pooled resources of their members or by borrowing from other persons or institutions on the security of the joint assets of the association. In this way they are able to lend to their farmer-members at comparatively low rates of interest, the lending being entirely supervised on democratic co-operative lines by the members themselves. These co-operative credit associations thus provide a means whereby the family structure of farming is able to gain more of the advantages of corporate finance without itself adopting the joint-stock form of business organization.

The Rate of Interest in Agriculture

The share of the available capital that will be invested in any industry will depend upon the comparative financial prospects of the industry concerned. In other words the supply of capital for agriculture will be determined by what the capital invested in the industry is likely to earn. This involves a consideration of the rate of interest in agriculture.

In the money market the price at which capital is bought and sold (i.e. borrowed and lent) is called the rate of interest and it is expressed as a percentage of the sum concerned for the period of one year. This quoted rate of interest is, however, best described as *gross* interest to distinguish it from *net* interest which is only one of its constituents. Thus in addition to the net interest which is the real reward of the lender or the seller, gross interest also includes a charge for the expense of handling the loan as well as an insurance charge against the risk of the loan not being repaid. The gross rate of interest, like all other prices, depends upon the supply of and the demand for the commodity concerned.

Agriculture has to compete with other occupations for the available supply of capital, and the supply price which lenders will ask for will depend upon the premium they consider necessary to cover the greater risk and the greater expense of lending to farmers. As already stated the biological nature of farming processes affects the financial and economic risks of investment in agriculture. Likewise the un-co-ordinated financial structure of thousands of small family businesses affects the expense of handling agricultural loans. The gross rate of interest charged to farmer-borrowers, will, therefore, include a premium to compensate for this higher degree of risk and expense.

On the other side, the demand price which farmers are prepared to pay for borrowed money will depend on their estimate of the productivity of their industry. Unless this is such as to enable them to pay the supply price which will induce lenders to lend, loanable capital will deviate to other industries which are prepared to pay more for it. In other words the use of capital as between one industry and another is determined by the principle of comparative return.

The same principle applies, of course, to the capital invested in the farm by the farmer himself, for he also expects to receive a sufficient return to enable him to pay all the expenses of production and to obtain the equivalent to the ordinary rate of interest on his invested capital. The family structure of the bulk of small and medium farms where labour and capital are in the same hands makes it very difficult to assess the return on invested capital in agriculture. In the process of accounting all that can be done is to put an arbitrary figure on unpaid family labour as a working expense, but this figure will obviously affect the balance available for the reward of capital. It would appear, however, that the rate of return on invested capital in agriculture does not compare favourably with the rate obtained in many other industries. Nor does it compare favourably with the rate which farmers have to pay for loans.

The rate of interest on landlord's capital also appears to be modest in comparison with what could be earned in alternative investments.

The obvious economic deduction to be drawn from this state of affairs is that the rate of flow of capital from agriculture to other industries is insufficient. But it is generally accepted that agriculture suffers from under-capitalization rather than from over-capitalization. The explanation of this apparent contradiction is to be found partly in the long-term nature of agricultural investment and partly in the persistence of non-capitalist features in the economic structure of the industry.

The influence of long-term investment is especially important so far as landlord's capital is concerned. The point has already been made that agriculturists work with a high ratio of permanent to working capital. It has also been stated that the majority of the farms of this country were laid out a hundred years ago, when capital was invested in buildings, hedges, ditches, farm roads and so forth. Most of this capital equipment is still functioning, which means that the original investment has had in fact a very high degree of permanency. This has been reflected in the investment being capitalized on the basis of a low annual interest rate which, in the short run, gives the industry the appearance of having a poor profit-earning record.

Meanwhile, however, much of this permanent equipment has become increasingly unsuited for modern farm practice, and much of it is, indeed, obsolescent. But private landlords cannot face the degree of dis-investment necessary before new capital developments can take place. This results in a position where the industry is handicapped by the permanence and immobility of its old capital equipment which hinders investment in the new permanent equipment which the industry badly needs. The reorganization of the present size and lay-out of many farms, whose inadequacy for modern farming technique has often been demonstrated, presents even a bigger problem.

Agriculture is not, of course, unique in this respect for there are other industries which are equally in need of drastic reorganization and modernization, and which find it equally difficult to raise the necessary capital on easy terms. Many observers hold the view that the very large amount of fresh capital required for the modernization of these industries is not likely to be forthcoming from commercial channels, and that the state alone can face up to the modest return to be expected from such long-term investments. The Government subvention to the Agricultural Mortgage Corporation is indeed a partial acceptance of this point of view so far as the agricultural industry is concerned. It will be necessary to return again to this aspect of the agricultural problem in dealing with land tenure as such.

The existence of non-capitalist features in the agricultural structure affects investment in both landlord's and tenant's equipment. In the first place, in the past investment in the large-estate system was often not only, or even primarily, a financial undertaking, for it had also its important social and amenity attractions. Frequently these non-monetary considerations resulted in the over-capitalization of estates where the landlord's chief motive was the pursuit of social prestige. Likewise many wealthy persons have acquired farms (as distinct from estates) and have used their ample resources in equipping and developing the farms concerned as " show " places. In particular much capital has been lavished on the building-up of pedigree herds and flocks with little if any regard to the intrinsic financial worth of the investment. While such over-investment may have benefited the particular farms and estates concerned it cannot be regarded as being conducive to the development of agriculture as an industry. On the contrary it has merited the comment that " the pursuit of agriculture is one of the most honourable ways of losing money." But these personal and non-financial aspects have become much less important in recent years with the result that the agricultural industry has now to compete on more level commercial terms for its share of the capital available for long-term investment.

Secondly, although farming in this country has long ceased to be " subsistence " farming it is nevertheless true to say that it is still possible for farmers to " live on capital." This means that farmers can, and do, continue to farm even though, judged by rigid financial standards, their farming is producing no profits. This happens more particularly during times of agricultural depression, but even in times of relative prosperity there is a hard core of " inefficient " farmers who continue to hang on to their farms through the gradual impoverishment of their capital assets.[1]

Thirdly, the structure and psychology of family finance is more suited to static conditions, and family finance is characterized by a pronounced inertia to any major change. Thus family farmers as a class prefer to adhere to well-tried systems of farming with which they are familiar, and they are always chary of facing the risk and cost necessary for the introduction of even tempting innovations. This conservatism has been particularly important in recent years when developments in farming have required substantial investment in what may be termed the " intermediate " type of capital equipment. During the war years when maximum output of food was of paramount importance it has been necessary for the state to subsidize investment of this kind also. Thus grants have been made to assist farmers to plough up their old pastures, to improve ditches and drains, to lime and manure their land, to eradicate bracken, to improve water supplies, and so forth.

Finally, the small scale on which the majority of farms operate renders them particularly liable to over-capitalization especially in buildings and in machinery and implements. So far as implements and machines are concerned the danger of over-investment is aggravated by the comparative shortness of the period during which quite expensive machines are used in any one year on the farm. Here, again, in the war years the state has greatly eased the situation through making available pool supplies of the more expensive equipment (and labour) for use on contract terms by farmers.

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[1] See pp. 213–14

This war-time assistance has gone some way towards increasing the rate of capital formation in the agricultural industry while avoiding some of the more flagrant dangers of over-capitalization on individual farms. At the same time the new capital investment itself has gone some way towards reducing the lag which existed between the findings of agricultural science and their incorporation in farming practice.

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CHAPTER V

LABOUR AS A FACTOR OF PRODUCTION

IN 1930 the Royal Institute of International Affairs calculated that the agricultural population of the world accounted for nearly two-thirds of the estimated total world population of just over two thousand millions. In 1938 the International Labour Office estimated that there were approximately 865,000,000 persons " gainfully employed " in the world, and of these 550,000,000, or 64 per cent, were engaged in agriculture. Measured by the use it makes of labour as a factor of production, agriculture is therefore far and away the largest industry in the world, providing employment for the greater part of mankind. It has already been suggested in the opening chapter of this book that this must be regarded as evidence of the misuse of the human agent, for the greatest economic progress has occurred in those countries where the division of labour as between food and non-food producing occupations has been carried furthest. Nowhere has this specialization gone so far as in Great Britain which, in June 1939, had only 4·6 per cent of its gainfully employed population engaged in agriculture.[1]

SIZE OF THE AGRICULTURAL POPULATION

There are two series of statistics dealing with the agricultural population of Great Britain, viz. the decennial reports of the *Census of Population* and the annual *Agricultural Statistics* based on the 4th June returns. The two sets of statistics differ in many respects, but they also supplement each other in some ways and together give a fairly comprehensive picture of the trend and composition of the agricultural population of the country. The two sections of Table V summarize the chief features of these statistics for the present century.

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[1] *Monthly Digest of Statistics* (H.M.S.O., 1946), No. 1, p. 1

TABLE V—Number of Persons engaged in Agriculture in Great Britain

(A) *Population Census Data*

	1901	1931	Per cent change
Total of all occupied persons . .	16,311,539	21,054,686	+ 29·0
Farmers	277,694	294,292	+ 6·0
Farmers' relatives	137,735	94,796	− 31·2
Farmers' employees.	758,594	606,475	− 20·1
Total farming	1,174,023	993,563	− 15·2
Horticultural occupations	140,337	297,813	+112·2
Other agricultural occupations . .	23,955	59,591	+148·8
Total agricultural occupations .	1,338,315	1,352,967	+ 1·1

(B) *4th June Agricultural Data*

		1921	1939	Per cent change
Regular workers :	Males over 21 . .	515,595	431,978	− 16·2
	Males under 21 . .	178,576	114,120	− 36·1
	Women and girls .	94,952	54,703	− 42·4
Total regular workers. . . .		789,123	600,801	− 23 9
Casual workers :	Males over 21 . .	111,723	64,094	− 42·6
	Males under 21 . .	31,074	7,834	− 74·8
	Women and girls .	64,161	38,533	− 39·9
Total casual workers		206,958	110,461	− 46·6
Total all agricultural workers .		996,081	711,262	− 28·6

The " drift from the land " which is the popular description of the decrease in the numerical proportion of the agricultural population, is corroborated by both sets of figures in Table V. The figures from the Population Census show, however, that the *relative* shrinkage which has occurred is more the result of an increase in the non-farming population than of the decrease in the farming population itself. Thus, during the first thirty years of the present century the total numbers employed in farming (i.e. leaving out horticulture and the ancillary agricultural occupations) fell by 178,460, while the total occupied population increased by 4,743,147. As a result the total in farming declined 15 per cent, but the proportion of the population employed in farming declined from 7·2 per cent to the low level of 4·7 per cent.

No population census has been taken since 1931, but a useful indication of trends since then is provided by the 4th June agricultural returns. The labour figures in these returns apply to all persons employed on agricultural holdings of one acre and above, excluding the occupier himself, his wife and his domestic servants. In other words they include all employees, whether permanent or casual, family or hired, paid or unpaid, working on holdings on 4th June. This information is available for every year since 1921, and the chief changes up to 1939 are shown in the lower half of Table V. During these nineteen years there was a decrease of 188,322 in the total number of regular workers. This represents a decrease of nearly 10,000 workers per annum or 23·9 per cent over the period—16·2 per cent for adult males, 36·1 per cent for youths and 42·4 per cent for women and girls. During the same period there was a decrease of 46·6 per cent in the numbers casually employed. In so far as this loss in manpower has not been accompanied by a reduction in the output of the industry, it should be regarded as a sign of increasing efficiency in the use of labour as a factor of production.

It will be noticed from these figures that the decline in numbers has been most marked in the younger categories, the exodus from the farms starting at about 18 years of age. One important result of this trend is shown by the fact that by 1931 the proportion of men between 18 and 29 years of age to total occupied was only 27 per cent in agriculture as against 34 per cent in all industries. Moreover, the proportion of older workers was much higher in agriculture which had 16 per cent of its total labour force over 60 years of age as against only 8 per cent for all industries. This higher proportion of older workers is partly accounted for by the relative absence of retirement in the ranks of agriculturists—both farmers and hired workers. The figures also show a substantial drop in the number of women employed, and in 1931 the proportion of women to total occupied was only 6 per cent in farming as against 30 per cent for all industries.

STATUS OF THE AGRICULTURAL POPULATION

The statistics of the Population Census throw some light on the status of agriculture's labour force. In particular they illustrate the following three characteristics of the industry: (*a*) the relatively high importance of family to hired labour; (*b*) the absence of division of function between managerial and manual labour; and (*c*) the small amount of specialization of the manual labour force.

(*a*) *The ratio of family to hired labour.* At the time of the census in 1931 family workers (including the farmers themselves) accounted for at least 39 per cent of the "farming" population of Great Britain.[1] It is unfortunate that neither the Population Census nor *Agricultural Statistics* gives an unambiguous statement of the numbers of *hired*, as opposed to *family*, workers in the agricultural industry. The figures of the Population Census are, however, sufficient to indicate the marked contrast which exists between agriculture and other industries in this respect, for they emphasize the importance of the family labour force in agriculture.

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[1] The corresponding percentages for England, Scotland and Wales were 36 per cent, 41 per cent and 60 per cent respectively.

This dependence of farming on family labour has several important economic consequences. In the first place, the size of the family rather than the labour requirements of the farm is often the decisive factor in determining the labour actually used. This may result in conditions both of under- and of over-staffing, for it is rarely possible to have a perfect fit of family to farm. Secondly, the family labour force is largely outside the influence of legislation regarding wages, hours of work and general conditions of employment. This has an important bearing on an industry that works irregular hours and by spurts. Lastly, the assessment of the cost of family labour is an arbitrary process, since much, if not most, family labour is on a non-commercial basis and there is little cash outlay involved in its employment. This explains why family farms may continue activities which would not be justified if the necessary labour was hired and paid in cash at commercial wage rates.

British agriculture then as compared with most other British industries has a much higher ratio of family to hired workers. Nevertheless, in terms of international comparison, British agriculture has a much higher proportion of hired workers in its total labour force. Indeed, the dependence of British agriculture on a proletarian class of workers must be regarded as one of its characteristic features as compared with the agrarian systems of the rest of the world.

(*b*) *The absence of division of function between managerial and manual labour.* This feature is illustrated by the following percentage figures which show agriculture's man-power classified according to its industrial status in 1931 :

Managerial	15·6 per cent
Working on own account . . .	13·1 per cent
Operatives	71·3 per cent
	100·0

Thus nearly 29 per cent of the agricultural population were their own masters and therefore entrusted with administrative decisions. Of these, however, only just over one half were employers of labour, the others being best described as "working on own account." The proportion of those of "managerial" rank is even higher than these figures indicate, for the figures do not include the large numbers of persons who have "agricultural holdings," but also follow other occupations under which they were returned for census enumeration. It is this which accounts for a substantial part of the big difference which exists between the number of "farmers" as given in the Population Census, and the number of "agricultural holdings" as given in the *Agricultural Statistics*—a difference of 185,000 in 1931. Whether these "part-time farmers" are included or not it is clear that the ratio of "managers" to employees is very high in agriculture. Using the crude statistics available, the ratio of employees to *all farmers* is about 2:1, while the ratio of employees to *employing farmers* alone is about 4·5:1. No other group of occupations, with the possible exception of small retail shopkeepers and fishermen, comes anywhere near this state of affairs.

This reflects, of course, the predominance of the small-scale producing units in farming, units wherein there is little, if any, distinction between managerial and manual duties.

It is unfortunate that the official statistics of employment in agriculture do not give the frequency distribution of farms according to the amount of the man-power used. But this deficiency has been partly remedied by data collected in 1941 for England and Wales.[1] These data are summarized in Table VI. They apply only to holdings of 5 acres and above, and they do not take casual workers into account, i.e. they apply only to *regular* workers (hired and family) other than the occupier and his wife. Approximately 127,000 holdings (44 per cent of the total) had no regular workers at all other than the occupier and his wife, and a further 65,000 holdings (22·5 per cent of the total) had only one regular worker who, in many cases, was a member of the occupier's family. These 192,000 holdings accounted for 92 per cent of those in the 5 to 25 acres group, 74 per cent of those in the 25 to 100 acres group and 25 per cent of those in the 100 to 300 acres group. Only 20 per cent of the holdings had more than two regular workers per holding, but these 20 per cent employed 70 per cent of the total regular labour force There were only 1,800 farms with 20 or more regular workers per farm.

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[1] *National Farm Survey of England and Wales*, pp 46–8

TABLE VI—Distribution of Regular Workers* on Holdings of 5 acres and above in England and Wales in 1941

No. of Regular Workers* per Holding	Total Regular Workers		Total Holdings	
	No.	%	No.	%
None	—	0·0	127,000	43·7
1	65,000	13·3	65,400	22·5
2	81,600	16·6	41,000	14·1
3	63,500	13·0	21,200	7·3
4	47,500	9·7	11,900	4·1
5–6	59,300	12·1	11,000	3·8
7–9	49,200	10·0	6,400	2·2
10–19	64,300	13·1	4,900	1·7
20 and over	59,600	12·2	1,800	0·6
Total	490,000	100.0	290,600	100·0

* Excluding occupier and his wife, but including other regular family labour

It is obvious from these figures that, excluding the farmers themselves, the bulk of the regular labour force in agriculture is to be found on a relatively small proportion of the farms of the country. It is equally obvious that on almost all the small and medium-sized farms the manual labour is provided by the farmer and his wife. This means that on the big majority of the farms of the country the farmer is both manager and manual worker. In the main the proportion of his time devoted to the two functions will vary according to the size of the farm. A survey of conditions in the eastern counties of England [1] suggested that on holdings of less than 50 acres the farmer's manual work amounted to as much as 43 weeks in the year, and his managerial duties to only 4½ weeks in the year. On farms over 300 acres in size, however, the corresponding figures were 16 weeks and 30½ weeks respectively. It is only on a small minority of farms that the farmer is concerned solely with management. This means that most farmers have themselves to perform the triple functions of entrepreneur, manager and manual worker. This constitutes one of the fundamental economic problems of the industry. Does agriculture stand to gain from the dispersion of managerial responsibility between so many, or does it stand to lose through being deprived of expert managerial ability trained and recruited as in most other industries ?

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[1] Carslaw and Graves, "The Labour Bill and Output on Arable Farms," *J. of R.S.S.*, vol. xcviii, Part iv, 1935

(*c*) *Division of labour on the farm.* The census report gives a very limited grouping of farm workers according to the type of the work done. Thus in 1931 those included in the category of " agricultural labourers and farm servants " were distinguished as follows :

Shepherds	18,382
Employed in tending cattle, dairying, etc. .	84,838
Employed in charge of horses	92,338
Not otherwise distinguished	380,564

Too much reliance should not be attached to these figures for the census classification is vague and badly defined. But this very vagueness is itself a reflection of the fact that there is little on the farm which is in any way comparable to the specialization of manual work as developed and practised under modern factory conditions.

There are two chief reasons for this contrast between farm work and factory work. First, the biological nature of most farm operations, depending as they do on the successive stages of growth of crops and of animals, makes it impossible to organize work on the basis of giving each worker a specific routine job to be repeated to the exclusion of all others. In other words, regularity and continuity do not characterize farm work. Secondly, as shown above, most farm staffs are very small as compared with factory staffs, but the tasks these small staffs have to perform are scattered over an area which, even for small farms, would dwarf the floor space of many a large factory. It is these two conditions—the continued repetition of identical processes and the employment of large staffs within comparatively small areas—which have been at once a cause and a result of division of labour in factory production.

On most large farms, however, some degree of division of labour is practised and the workers are designated into classes such as tractor men, dairy workers, shepherds and so forth. But these specialist workers generally can and do take a hand with other kinds of farm work if and when necessary. In other words, specialization on the farm has not, as in the factory, made the specialist worker ignorant of other processes in his industry. This is partly because few farmers have enough land or enough capital to organize their farms in departments large enough to constitute optimum units for the full-time employment of specialist workers. With livestock, however, there has been some tendency in this direction in recent years more particularly with dairy units, pig units and poultry units. But on the great majority of the farms of Britain at the present time the farmers and their workers have to be tractor drivers, livestock men and general workers all in one.

In a sense the existence of specialist farms, such as dairy farms, poultry farms, sheep farms, etc., is a form of division of labour in agriculture. But specialization between farms takes on another form which approaches much more closely to the general conception of division of labour. Thus many of agriculture's finished products are the result of the activities of a combination of farmers who have divided the process of production between them. Many illustrations of this vertical division of labour may be given : west country farmers produce dairy stock for the intensive milk producers of the Home Counties ; Welsh farmers rear store cattle to be finished off into prime beasts on the Midland pastures ; Scottish farmers raise seed potatoes for the potato growers of East Anglia; some poultry farmers rear day-old chicks for sale to other poultry farmers whose sole concern is the production of eggs for sale.

The threefold characteristics of farm labour discussed above, viz. the fusion of managerial and manual work, the very small numerical size of most farm staffs and the comparative absence of division of labour in the factory sense, are of the greatest importance in understanding most farm problems in so far as they are concerned with labour efficiency and organization.

LABOUR REQUIREMENTS AND THE DEMAND FOR LABOUR

The requirements of the farm for labour are influenced by many factors, of which the most important are the size of the farm, the system of farming and the degree of technological development. The third factor is discussed in a later section of this chapter.

In general a small farm will require more labour per 100 acres than a large farm practising the same type of farming. In general, also, the more intensive the system of farming the greater is the need for labour. The highest employment of labour is found, therefore, on the intensively managed small farms of the country. For example, at one extreme, the small but intensive poultry holdings of Lancashire, although they may be run entirely by the farmer and his wife, employ the equivalent of over 20 regular workers per 100 acres; and market garden and horticultural holdings require 10 or more permanent hands per 100 acres. At the other extreme, the large extensive arable farms on the southern chalk or on the Yorkshire wolds and the hill sheep farms of Wales employ only one or two men per 1,000 acres. In between these extremes many grades of intensity of employment are to be found.

In the main it is the kind of crops grown and the type of livestock kept which cause these variations. It is of some use, therefore, to express the labour requirements of farming in terms of the crop acres and in terms of the livestock numbers which one man can cope with.

With the methods of cultivation now generally in use it is roughly true to say that one man is required for every 100 acres of cultivated land. But there is a wide range in the labour requirements of the various crops that may be grown. For example, 1 acre of roots, potatoes or sugar-beet requires from three to four times as much labour as does 1 acre of cereals. This also applies to vegetables grown on a farm scale. The heaviest labour-consuming crops are, however, the market garden crops, a market garden of 5 acres, for example, requiring in general one regular worker plus extra help for seasonal tasks.

Livestock also vary widely in their demand for labour, the variation depending on the system of management as well as on the type of livestock kept. For example, 1 man and a boy can look after a herd of 60 cows with the Hosier system of outdoor mechanical milking, while with indoor hand milking 1 man is needed for a herd of 14 cows. Again, 1 man can manage 80 store cattle on pasture, but only half that number if fattened indoors. Similarly with sheep, a shepherd can look after a flock of only about 200 ewes in folds, but he can manage twice that number on open land and even up to 500 or 600 on mountain grazings. With indoor pig-keeping 1 pigman can look after 20 sows and their progeny, as against 30 sows and followers on the outdoor system. Finally, a poultryman can have charge of 1,000 to 1,500 birds in folds as against 2,000 birds in slatted-floor houses.

Such yardsticks for measuring labour requirements have many useful applications, but they are circumscribed in practice by the small size of the majority of farms and by the fact, already noted, that few farms are large enough to engage full-time specialists either in the crop or in the livestock departments.

It is probably true to say that there is less variation in the demand for labour from one year to another in agriculture than in most industries. But any advantage which the farm has in this respect is more than offset by the seasonal and daily fluctuations in its labour requirements.

The existence of seasonal fluctuations has always been recognized as the most difficult problem in agricultural employment. It is especially marked in crop production and, indeed, it must be as old as cultivation itself. Crops have very definite peak requirements for labour at planting and at harvesting. The winter months, on the other hand, provide little if any employment so far as crops are concerned. In this way slack or even dead periods follow peak periods during which the whole effort of the regular labour force may be unable to cope with the situation.

On the whole, seasonal requirements of livestock are more evenly distributed, though here also there are seasonal rushes such as lambing and the shearing of sheep. In general, however, the care of animals is a continuous duty which provides employment for every day of the year. The fluctuation here is one from hour to hour rather than from day to day or from season to season. Dairy-farming provides an important illustration of this, for on the specialized dairy farm the size of the labour force is determined mainly by the requirements at milking time, i.e. by the requirements of a comparatively short period of an hour or so twice daily. The problem then becomes that of the optimum utilization of the working staff during the intervals of each day when the animals do not require attention.

The nature of the problem is, of course, the same for both daily and seasonal fluctuations. It is the problem of adjusting the size of the labour force to the work to be done in such a way as to avoid over-staffing, which leads to waste, and under-staffing, which leads to over-work, both of which are equally undesirable. There are two ways in which the problem can be tackled. First, it can be tackled by selecting a combination of enterprises which will dovetail into each other in their demand for labour and thereby ensure the optimum distribution of work throughout each day as well as from season to season for a regular staff of workers. Secondly, it can be tackled by employing a minimum regular staff and depending on overtime and the employment of extra hands to cope with peak or rush periods. The first method involves a consideration of the wider problems of farm management. The second method, on the other hand, is mainly a labour question.

The traditional method of coping with peak seasonal labour requirements in farming has been the use of casual labour. Nearly all specialized systems of farming, especially crop husbandry, have made great use of a casual labour supply. Hop-farming in Kent, market-gardening in Middlesex and potato-growing in the Fens are well-known examples. But casual labour is also a feature in mixed farming, though the extra force required on any one farm at any one time is never so large as for the examples just mentioned. Table V shows that 15·5 per cent of the total agricultural labour force (excluding farmers and their wives) consisted of casual labour in 1939. These figures refer to labour actually on farms on 4th June and are, therefore, conditioned by the need for casual labour at that date. More than a third of the casual labour employed in 1939 was made up of women and girls. In this connection, again, it is necessary to remember that much of the casual labour employed at the beginning of June is engaged on work of a semi-skilled nature such as hoeing or soft fruit picking. The official statistics give no indication of the length of employment of these casual workers, nor is there information about the numbers employed at other seasons of the year. The report on the survey of the eastern counties already referred to suggests that in that area, where the proportion of casual labour is high, the casual workers included in the official statistics for 1935 obtained on average about six months farm work during the year. In this country agriculture recruits its casual workers from many sources. Some come from the ranks of small farmers and from the neighbouring villages and towns. Others are migrant workers such as the London hop-pickers in Kent, the gypsy fruit-pickers in Worcestershire and the Irish labourers in the potato and sugar-beet fields of East Anglia.

In areas of small farms and where family labour predominates, as in Wales, the problem of coping with labour rushes for such operations as haymaking, harvesting, threshing and shearing is often solved by spontaneous co-operation amongst the small farmers themselves. Since 1939 there has been some extension of this co-operation on more organized lines to meet the requirements of war-time conditions. It is possible that this organized pooling of labour staffs may become a regular feature of small-scale farming in many districts. Since 1939, also, much use has been made of contract labour supplied from both private and public sources, and this has provided another valuable method of coping with peak requirements. The use of these contract services differs from the ordinary use of casual labour in that the labour used is itself organized and is not dependent on casual employment.

Rush periods in agriculture, as in other industries, are also met by the use of overtime labour. Indeed overtime in the sense of extending the working day has a special significance in farming and for the following reason. Many of farming's rush periods result from the paramount need for co-operating with nature at the right time. The land must be cultivated, crops must be sown and the harvest must be gathered in season. But it may only be possible to continue this co-operation with nature at certain hours of the day during the critical stage, e.g. the hay crop may not be ready for carrying before late in the afternoon, and it may be vital to continue until dusk in order to secure the crop in optimum condition. Another type of overtime peculiar to farming results from the supervision of livestock necessitating as it does feeding at a fixed time each morning and evening on every day of the week including Sunday.

As a general rule it is wise to reduce overtime work to a minimum for there is a limit to the physical capacity of the most willing worker. In this connection, however, it is necessary to remember that the day's work on the farm varies in tempo and there are periods each day when work proceeds at a more leisurely pace. There is nothing in farm work to compare with the unaltering pace set by the machine for the factory worker. This is important in considering the length of the working day especially where family labour is the main supply and where overtime does not result in an increase in the cash cost of labour. But it must also be remembered that the slack periods during the day are not free periods which can be regarded as leisure time. Indeed, one of the most characteristic features of farm work is " a quality of endlessness " which bears heavily on the small and medium-sized farms with labour staffs altogether too small to enable the application of defined hours and time off. If these small farms are to continue as a feature of the industry, then there is much to be said for the use of organized mobile workers, not only to cope with periods of peak labour but also for the purpose of providing the gift of regular " free time " for the family workers.

EFFICIENCY OF LABOUR

There is much popular discussion on the question of the efficiency of farm labour. Much of it has centred on generalizations about the relative amount of skill required from the farm hand and from the factory worker. Again, comparisons are often made between the north-country " hind " and the south-country labourer, while it is a common opinion amongst farmers that the farm workers of today are not in the same category as those of an earlier generation. The economist cannot accept generalizations of this kind, for it is part of his job to attempt some measurement of labour efficiency and the conditions on which efficiency depends.

The economic measurement of efficiency in the use of labour as of any factor of production is the output obtained per unit of the factor used, i.e. in the case of labour on the output per worker or per man hour. An increase in the output per man can be brought about in two ways : (*a*) by an improvement in the efficiency of the worker himself, (*b*) by an improvement in the structure and organization of the farming unit. In considering labour efficiency it is necessary, therefore, to examine how far it depends on the workers themselves and how far it depends on the direction they receive and the organization within which they function.

The small size of working staffs coupled with the absence of division of labour on the farm means that agriculture, in contrast to manufacturing industry, demands from its workers a higher degree of personal responsibility and willingness as well as a greater range of technical ability.

Willingness and a sense of responsibility are valuable qualities in all workers, but especially so in the worker on the farm, who usually finds himself working on his own far from supervision, and possibly in charge of valuable livestock or expensive machinery. On the small and medium-sized farms the personal interest of the farmer and his family is calculated to ensure these qualities in the farm staff. On farms employing hired workers, the willingness and responsibility with which the work is done will depend partly on the character of the workers and partly on the conditions of their employment and remuneration.

The more varied range of technical ability required from farm workers can be appreciated when it is remembered that most workers on the farm will need to use almost daily some physical strength, some mechanical skill, some livestock sense and some crop sense. This means that on the farm skilled work is far from being synonymous with specialist work. On the contrary the routine seasonal duties of the *general* farm worker constitute most of the work on most farms, and these varied duties all require their mead of technical skill. The technical ability of the farm worker, whether family or hired, will depend partly on the worker's physical and mental fitness, partly on his training and partly on his experience.

The standard of physical and mental fitness of any group of workers is partly a matter of heredity and early environment, and partly a matter of the age composition of the group. It is probably true to say that the bulk of the supply of farm labour comes from the ranks of farm workers themselves, for the majority of working farmers are the sons of farmers and the majority of the hired farm workers are the sons of hired farm workers. This means that most of the workers on the farm are country born and country bred. They therefore stand to gain and to lose, as the case may be, from the advantages and the disadvantages of country environment in matters of housing and nutrition as well as in matters of educational and social opportunities. The statistical evidence of age distribution given in the Population Census shows that agriculture, as compared with other industries, has a lower proportion of its man-power between the ages of 21 and 55 years. Moreover, the decline in the numbers of agricultural workers has been most severe in the younger categories, the exodus from the farms starting at about 18 years of age. There is a progressive tendency, therefore, for the older workers to become relatively more numerous, and this must be regarded as having some adverse effect on both the quality and quantity of work even after allowing for the advantage of experience which age is supposed to possess. More important, however, is the implication that, as an occupation, agriculture is becoming less attractive for the younger generation, and there is some danger of regarding it as a blind alley occupation.

Although mental and physical qualities have an important bearing on the worker's technical ability, technical ability is itself mainly a matter of training and experience. In the past agriculture has tended to put all the emphasis on experience almost to the complete neglect of formal training. Indeed the young recruit to farm work, whether farmer's son or hired boy, has generally been regarded and used as an additional worker rather than as an apprentice or learner. The amount of training he received was a matter of chance depending on the goodwill and on the ability of his employer and his fellow-workers. The young beginner was expected to pick up the simpler tasks, gradually to proceed to the more difficult until, in course of time, the whole atmosphere of farm work became a second nature to him. In the past there was probably something to be said in favour of this empirical method of learning; but with the modern equipment of farming it can no longer take the place of more formal instruction.

In this connection there is another marked difference between farming and manufacturing industry. Generally speaking technological progress in the factory is tending to make the routine tasks of the mass of factory workers progressively more and more simple. On the farm, however, technological progress is demanding a progressively higher standard of skill and intelligence from the workers. Attendance on farm machinery or work on a well-equipped dairy farm producing high-quality milk may be given as two important illustrations. To meet this situation one of the great needs of the industry is the institution of formal courses of instruction in the carrying out of labour operations on the farm which will become the recognized channel for the recruitment of agriculture's man-power.

The most efficient labour can be wasted if it is not managed to the best advantage. The problem of labour management in the narrower sense of day-to-day routine resolves itself into three stages, viz. the planning of the programme of work, the assignment and supervision of the workers and the assessment of their performance.

Planning the programme of work for the labour staff of a farm, in turn, involves two considerations: (*a*) the need to keep the staff fully employed, and (*b*) the need to keep it employed to the best advantage. The problem of full employment is complicated by the need for flexibility and even alternative programmes to meet the factor of climate which so often decides what can and what cannot be undertaken. Farm tasks can be conveniently grouped into those which cannot and those which can be postponed without detriment to the products being produced. Most direct work on crops and on livestock falls in the former category, for the biological nature of most of it renders its timing of paramount importance. Indeed success with both crops and livestock depends on doing the right things *at the right time*. Work in the second category on the other hand, consists mostly of establishment work which is only indirectly productive and should always be reserved, as far as is possible, for those periods when more direct work on crops and livestock cannot be carried out. It is not possible to ensure this without planning ahead and on all farms, large and small, the farmer should know well in advance what jobs he and his men will do each day, wet or fine. In this way only can the farmer ensure that his time and the time of his workers will be used to the best advantage.

The direction and supervision of farm work also present difficulties which are not met with under factory conditions. In the factory the machine sets the pace of work. On the farm the farmer himself must be responsible. That is why farmers who do most of the work themselves or who work alongside their men are often able to obtain better results. All farmers should know how much time and how many men are required to complete the various tasks. This assessment of the labour requirements of farm tasks cannot be done with the same degree of accuracy as in a factory. But the fact that the farmer has to use clumsier yardsticks only increases the need for more attention to this aspect of farm organization. Far too often the difficulties involved have been accepted as an excuse for the perpetuation of traditional ways of work which are equally extravagant of the farmer's financial resources as they are of the worker's physical resources.

In this connection reference may be made to the development in Germany and elsewhere of the scientific study of farm labour (*Landarbeitslehre*). Thus at the Pommritz Institute, established in 1920, time and motion studies, as well as fatigue studies, long practised under factory conditions, have been applied to farm work also. Farm tools and implements have also been studied in an attempt to establish and standardize the most suitable types. (The significance of this is apparent from the fact that it was estimated that over 600 different tools were used in Germany for potato lifting alone !) Still other studies have been directed towards the investigation of psychological factors ranging from the influence of systems of remuneration to the relative efficiency of team, column and individual work for various field operations. Lastly much attention has been given to the study of the influence of farm layout on the efficient use of labour. This question of layout is of notable importance in farming because the farm worker, even on the best-planned farm, has to walk much longer distances in the pursuit of his daily work than has his counterpart in a factory. There is greater need, therefore, that walking distances on jobs and especially in moving from job to job should not be unnecessarily lengthened through poor planning. In this connection the situation of the steading relative to the field, the arrangement, shape and size of fields as well as the spacing of buildings, need drastic revision on many farms. The study of all these questions, which have a bearing on farm-labour operations, no less than the training of farm workers, is capable of a much more formal and scientific approach than has hitherto been generally accepted.

INFLUENCE OF TECHNICAL AND SCIENTIFIC IMPROVEMENTS

In the present phase of agricultural development the use of labour-saving equipment is one of the most potent factors affecting the efficiency and productivity of labour in agriculture. Labour-saving implements have, of course, been used in farming from early times ; but until comparatively recently there has been no counterpart in agriculture to the great influence of mechanization in manufacturing industry. During the first decade of this century the mower, the reaper and binder and the threshing machine were the chief representatives of mechanical aids in agriculture. Moreover, the horse was almost ubiquitous as a source of power for both field work and farm transport. The application of the internal combustion engine to farm work especially in the last twenty-five years has changed the whole aspect. The adaptability of the petrol engine, the tractor and the motor car to small units has been mainly responsible for this change.

These three classes of power equipment have affected each of the three aspects of farming which together constitute the bulk of its labour requirements. In the first place the motor car has had a profound influence on farm transport affecting not only the accessibility of the farm to market, but also the mobility of the farm staff for social and economic purposes. Secondly, the farm tractor, with its full complement of tillage and harvesting machinery, has exerted an almost revolutionary influence on crop husbandry. Indeed, with the exception of a few tough problems still outstanding (notably muck-carting, weeding, singling and the lifting of roots) the machine has triumphed over most of the processes of crop production. Lastly, the stationary engine has influenced livestock production through lightening the task of food-preparing, while in dairying it has also been successfully applied to the process of milking, cooling and sterilizing.

In many ways the use of machinery and the process of mechanization have affected the farm staff differently from the factory staff. This is particularly true of labour in crop husbandry where the machine has to be taken to the raw materials and where mechanization has not resulted in the simplification of processes as in a factory. As a result farm mechanization has not led to any marked increase in the division of labour apart from replacing the carter and the wagoner by the tractor driver and the mechanic in the farm team. Furthermore, machines in the factory require large numbers of persons to feed them, and the process of feeding is becoming progressively simpler and almost automatic. Machines on the farm, on the other hand, are generally attended by single operators who must, moreover, possess a high degree of skill and intelligence. On the farm the primary object of the machine is by no means always to save labour, for speed and the elimination of drudgery are often equally important considerations. Thus the introduction of the tractor for field work has helped to make the farmer much more independent of the weather, for its greater speed enables him to push through the vital seasonal operations of preparing the seed-bed, sowing and harvesting in the minimum of time. Incidentally the replacement of horses by tractors has also released for more direct productive purposes land and labour previously required to grow horse-food. Lastly the size of the farm and the structure of the family business have so far imposed handicaps on mechanization that have been eliminated in factory production. Indeed, there is evidence that in farming the use of machinery tends to strengthen the family structure by making it possible for the family workers to cope with the farm tasks with less help from hired employees.

In appraising the influence of technical improvements on labour efficiency it is not enough to consider improvements in mechanical equipment alone. Other advances, especially those affecting the productive capacity of crops and of livestock, also influence the efficiency of labour in so far as they affect the relationship of output to employment. Thus in the field of crop husbandry the use of new and improved varieties of plants and the practice of modern methods of plant nutrition and pest control are all important. Likewise with livestock production, due weight must be given to the influence of the great strides made in the practice of improved methods of breeding and feeding as well as in combating livestock diseases. In fact, improvements affecting the rate of maturity as well as the regularity and volume of output of crops and animals have all a bearing on the productivity and efficiency of the labour used in producing them.

In considering the influence of all these technological and scientific improvements on employment in farming it is still useful to bear in mind John Stuart Mill's division of improvements into two groups. One group includes those improvements which " have not the power of increasing the produce, but have that of diminishing the labour and expense by which it is obtained." The other group includes those improvements which " enable the land to yield a greater absolute produce, without an equivalent increase in labour." Roughly speaking, in farming, mechanical improvements fall into the first group, while the more strictly scientific improvements in the growing of both crops and animals fall into the second group. The mechanization of cereal production, and especially harvesting, is almost the classic illustration of the first group : a man with a sickle might cut half an acre per day, but a man with a self-propelled combine-harvester can cut and thresh in one operation up to 3 acres in 1 hour. Increasing the yield of cereals per acre by the use of improved strains and chemical fertilizers, or increasing the yield of milk per cow by progeny testing and by balanced feeding are equally good examples of the second group : in these two examples the particular scientific improvements concerned have increased the output of cereals and of milk per unit of labour input without reducing the labour requirements per acre or per cow.

In general, mechanical improvements have been relatively more important in crop husbandry while the more strictly scientific improvements (especially in genetics and nutrition) have been relatively more important in livestock farming. This had had an important bearing on the economy of employment in British agriculture with its pronounced trend towards livestock farming. Thus any reduction of direct labour on crop production (largely seasonal in character) has been partly offset by the increase in the direct labour requirements (of a more regular character) of dairy cows, pigs and poultry. Moreover, as pointed out above, the main effect of improvements in these livestock branches of farming has been to increase the output per unit of labour input without reducing the total supply of man-power used. Technological improvements, coupled with the trend towards livestock farming, have, therefore, tended in general towards a more stable and better utilization of man-power in British agriculture.

In view of these trends it is not surprising that the various estimates which have been attempted of the productivity of man-power in British agriculture provide evidence of progress. One estimate, using the physical yardstick of the crop- and stock-managing capacity per man, shows that in the twenty years from 1921 to 1941 the work output per person engaged in agriculture increased by over 20 per cent.[1] Another estimate expresses the ratio of output to labour input in financial terms, and shows the net output per worker in British agriculture as having increased from £150 in 1925 to £205 in 1937.[2] These two measures of technical efficiency and of financial productivity complement each other, for without improving technical efficiency high financial productivity is not possible. In other words output per person employed is the foundation for progress in the standard of living of workers in agriculture as in all other industries. In the next section this question of the standard of living is examined further in terms of wages and conditions of employment.

WAGES IN AGRICULTURE

The net output per worker as given above was calculated by dividing the estimated value of the total net output of agriculture by the estimated total number of workers—family and hired, manual and managerial—employed in the industry. But it is necessary to consider the reward of the class of hired workers in greater detail for, although in the long run they must be conditioned by the net productivity of the industry as a whole, wages are in practice subject to other considerations partly social and political, partly legal and partly economic.

There is much in the history of agricultural wages which would appear to support the now discredited *Subsistence Theory of Wages*, according to which wages are supposed to drop to just that amount which is necessary for the subsistence of the worker and his family. Indeed up to about the middle of the last century agricultural wages in this country were subject to legislative and administrative control which was actually based on the conception of a subsistence standard. This was the essence of the old Poor Law and the notorious Speenhamland system with its guarantee of a weekly income to the farm worker fixed in terms of bread prices and the size of his family. Although we have travelled far from those days, wages in agriculture still continue to compare unfavourably with wages in most other industries. Thus, in 1939 the wages of general farm workers were only about three-quarters of the wages of general workers in urban occupations. More significant is the apparent acceptance of this gap as a permanent feature of our economy. Indeed present-day requests by farm workers for increases in the agricultural minimum wage are invariably countered by the argument that an increase in farm wages results in a proportionate increase in the wages of non-agricultural workers.

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[1] A. W. Ashby, *The Rise of Efficiency in Agriculture* (Royal Institute of Great Britain, 1942)

[2] O. J. Beilby, "Comparative Labour Efficiency in Agriculture," *Empire Journal of Experimental Agriculture*, vol. ix, No. 34, 1941

In any consideration of relative wages it is necessary to bear in mind the important difference between the worker's *nominal* wage and his *real* wage. Since 1939 nominal agricultural wages have risen from about 35/- to 90/- per week, but it is unlikely that the real wages have increased by this amount. In other words, although the nominal wages are 157 per cent higher, the money the worker receives will not buy 157 per cent more goods and services. The amount of money a worker receives constitutes his nominal wage, but his real wage is measured by the amount of goods and services which he can buy with his nominal wage. It is here that the difference in the cost of living in town and country becomes an important consideration in assessing the relative standard of living of farm workers. It is not easy to assess this difference, but it is certainly true to say that the difference is becoming progressively smaller as the old division between rural and urban communities breaks down.

The causes of disparity of wages between occupations was exhaustively examined by Adam Smith in *The Wealth of Nations* where the following five canons are enumerated: " first, the agreeableness or disagreeableness of the employments themselves ; secondly, the easiness and cheapness, or the difficulty and expense of learning them ; thirdly, the constancy or inconstancy of employment in them ; fourthly, the small or great trust which must be reposed in those who exercise them ; and fifthly, the probability or improbability of success in them."

All these canons of Adam Smith continue to have a bearing on the divergence between agricultural and non-agricultural earnings. But this divergence has been accentuated by other considerations largely of an historical character. One of these considerations has been fundamental throughout . *the farming population has always been residual and has never had a scarcity value.* In other words, while urban industries, especially in their early and expanding days, have had to attract workers *in*. farming has always been needing to get workers *out*.

In this country the emergence of the class of hired farm workers, following on enclosures and the engrossing of farms in the late eighteenth and early nineteenth centuries, coincided with the unprecedented rise of urban industry. For several generations the farming population was the main, if not the only, source from which the new urban workers could be recruited, and the chief method of recruitment was the incentive of higher wages. Moreover, previous to the rise of these urban industries, agriculture must have carried an endemic surplus of workers for whom there was no alternative employment.

Secondly, this relative over-supply of labour in agriculture during the formative period in the evolution of the modern structure of the industry engendered an attitude of extravagance in its use on the part of employing farmers. Indeed, before the present century the need for economizing in the use of labour on the farm was not seriously considered. This was especially true of those districts such as East Anglia, Oxfordshire and Dorset which were more remote from the new urban concentrations, and in which farm wages were even lower than the average for the whole country. Moreover, these counties were also the home of the large arable farms employing relatively large numbers of workers per farm. They were also the counties where the Norfolk four-course rotation was the basis of farming. Indeed the system of High Farming was itself largely made possible by the existence of an ample and cheap labour supply, which it took for granted.

Thirdly, the migration from country to town naturally attracted the more enterprising and vigorous of the population. This tended to give a residuum character to the farm-labourer class which had its counterpart in a lower level of remuneration.

Fourthly, not only did agriculture constitute the reservoir for the supply of urban labour, but it was also expected to receive back the unwanted surplus of the towns during periods of adversity. This attitude still persists. Thus during the depression of the nineteen-thirties one of the measures attempting to alleviate urban unemployment was the settling of the surplus workers on the land. It has been truly stated that agriculture is expected to play " the thankless role of acting as the great population insurance system of the world."

Fifthly, for a very long time the emergence of an agricultural proletarian class was accepted with considerable reservation, and there was much toning down of the cash nexus relationship between master and man. Thus the great importance of payments-in-kind, the prevalence of the living-in system and the inertia of the small farm with its very small number of employees per employer all tended to invest the farm worker with a semi-domestic, semi-subsistence status. Specially significant in this connection is the persistence of attempts to reinvest the hired worker with land and the conception of an " agricultural social ladder " which has no counterpart in the philosophy of the urban working class.

Sixthly, although workers are employed more or less on a permanent basis, the farm itself is not productive all the year round. Indeed the value of a man's work on the farm changes not only from season to season but from day to day. A low permanent maintenance wage may be regarded, therefore, as reflecting to some extent the seasonal worth of the worker spread over the whole year.

Lastly, the collective bargaining position of the hired worker in agriculture has always been relatively weak, due largely to the geographically scattered nature of his calling and the consequent difficulty of organizing trade unions which played so important a part in improving the wages of workers in urban industries. But farm workers have always been in a weak position for individual bargaining also and for the simple, but fundamental reason, that there has always been too many of them. Recent demands of workers in this country and in some parts of the United States indicate, however, that perhaps for the first time since the Industrial Revolution farm labour has had a scarcity value.

STATUTORY CONTROL OF CONDITIONS OF EMPLOYMENT

The absence of effective organization and the prevalence of low wages are the two conditions required to justify State regulation of wages in this country as laid down by the Trade Boards Act of 1909. So far as agriculture was concerned, however, the first step to regulate wages was not taken until the Corn Production Act of 1917 set up the first Agricultural Wages Board. The Act of 1917 was also concerned with the granting of subsidies for cereal production, and when these subsidies were abandoned in 1921 the act of repeal also abolished the Wages Board. Legislation was then passed establishing voluntary conciliation committees to replace the compulsory Wages Board, but these committees completely failed to implement collective bargaining on a voluntary basis. In 1924 the Agricultural Wages (Regulation) Act re-established the Wages Board system and the statutory regulation of farm wages in England and Wales. In 1937 the Agricultural Wages (Regulation) (Scotland) Act established for the first time analogous machinery for enforcing agreed wages and conditions for farm workers in Scotland.

The Act of 1924 set up county or district agricultural wages committees together with a national or central Agricultural Wages Board for England and Wales. The county committees consist of from six to eight representatives of employers (nominated by the National Farmers' Union) and an equal number of representatives of workers (nominated by the National Union of Agricultural Workers and the Transport and General Workers' Union) together with two impartial members appointed by the Minister of Agriculture. The chairman, who must be one of the appointed members, is selected in each case by the committee itself. The Central Wages Board consists of eight members representing employers and eight representing workers, together with four impartial members and a chairman appointed by the Minister of Agriculture. The constitution of both the county committees and the Central Board means that in practice they resolve themselves into a combination of collective bargaining and arbitration, the bargaining being done by the interested representatives and the arbitration by the impartial members.

From 1924 to 1940 the county committees were entrusted with the duties of (1) fixing the minimum rates of wages (including overtime rates) for all agricultural workers, (2) the definition of the employment to be treated as overtime employment, and (3) the definition of the value of all perquisites to be reckoned as part payment of the minimum rate of wages in lieu of payment in cash. So far as was practicable the committees were expected to fix minimum rates which would " secure for able-bodied men such wages as in the opinion of the committee are adequate to promote efficiency and to enable a man in an ordinary case to maintain himself and his family in accordance with such standard of comfort as may be reasonable in relation to the nature of his occupation." The Central Wages Board had the duty of making the necessary orders by which the rates fixed by the county committees became effective ; it also acted in an advisory capacity to the county committees and had powers to fix wage rates in those counties where committees failed to do so.

The Agricultural Wages (Regulation) Amendment Act 1940 altered temporarily the relative functions of the two bodies and adopted the system of a national minimum wage to be fixed by the Central Wages Board, while leaving the county committees free to settle county rates (subject to the national minimum) and to regulate other factors, such as hours of work, overtime and extra allowances, in keeping with local conditions. The temporary transfer of wage-fixing powers from the local agricultural wages committees to the Central Wages Board was made permanent by the Agricultural Wages (Regulation) Act, 1947. This Act enables the Board to fix minimum rates of remuneration on a wider basis. The duty of defining and valuing allowances in kind which may be reckoned in part payment of wages is also transferred from the local committees to the Board, except that the committees continue to function as regards re-valuation of individual cottages which vary from standard. The local committees also continue to deal with the issue of permits of exemption for workers suffering from disability. In the exercise of its functions the Central Wages Board is required to have regard to any representations made to it by the local committees, while the local committees are to exercise their powers in accordance with any directions from the Central Board.

This change of the Central Wages Board's advisory function into an executive one has enabled it to secure a greater measure of simplicity and uniformity in wage-rates and conditions of employment throughout the country. At the present time (1948) in England and Wales the prescribed national minimum wage for ordinary adult male workers (other than part-time or seasonal workers) is 90/- per week. The hours for which this national minimum is payable have been reduced to a weekly working period of 48 hours in both winter and summer. These hours exclude meal-times but include "any time during which, by reason of weather conditions, an employer has prevented from working a worker who was present at the place of employment and ready to work." Orders are also prescribed for weekly half-holidays, for public or bank holidays and for annual holidays with pay. Any employment over and above these stated hours must be paid for at overtime rates which, for adult male workers, must not be less than 2/4 per hour on ordinary week-days and 2/10 per hour on the weekly half-days, Sundays and the public holidays which are all defined as overtime employment.

Weekly and overtime rates are also prescribed for younger workers, for female workers and for workers without agricultural experience. County committees can issue permits to allow individual workers who, through age or infirmity, are incapable of earning a full weekly wage to be employed at a specified amount below the minimum rates. The wages payable for the employment of the various categories of part-time and casual workers are also prescribed at hourly rates proportionate to the weekly rates of regular workers. Lastly, the Agriculture (Miscellaneous Provisions) Act, 1944, conferred powers on the Agricultural Wages Board to fix minimum rates of wages on a time-work basis for workers employed on piece work.

Evasion of the minimum wage regulations by employers is an indictable offence making them liable on summary conviction to a monetary fine as well as to the reimbursing of the under-paid workers by the amount of the under-payment. The carrying out of the regulations is policed by wages inspectors appointed by the Ministry of Agriculture. Between 1925 and 1937 these inspectors recovered a total of £163,800 for under-paid workers. In addition the National Union of Agricultural Workers also claims to have recovered large sums for their own members.

Besides enjoying the regulation of wages and hours of employment under the Wages Board, hired farm workers also benefit from the various statutory insurance schemes which exist. First, under the Workmen's Compensation Acts, the farmer, as employer, is personally liable to compensate the worker for loss of employment due to accidents arising out of, and in the course of, his employment, or to compensate the worker's dependents in the event of the accident being fatal. Farmers can and do, of course, contract with an insurance company to carry this risk for them. Secondly, farm workers share with other workers in the advantages of compulsory health and pensions service instituted by the National Insurance Act, 1911, and by subsequent legislation. Thirdly, the Unemployment Insurance (Agriculture) Act, 1936, extended the unemployment insurance scheme to hired workers in agriculture, but at rates, both of benefits and contributions, somewhat lower than in other industries. This anomaly was removed when the new National Insurance Scheme became operative.

INFLUENCE OF STATUTORY CONTROL

With minimum wages fixed for defined hours of work, fixed overtime rates, provisions for holidays and statutory insurance against accidents, ill-health, old age and unemployment, the relations of employer and employee in agriculture have come increasingly into line with those obtaining in other industries. This is because it is neither desirable nor expedient to differentiate in social legislation, especially in a small country like Britain. But the impact of this levelling-up process on an industry primarily governed by traditional customs has resulted in many problems of adjustment.

The first is the influence on earnings and the protection of the workers against low wages. Already before the adoption of a national minimum in 1940, the wages regulation system had resulted in a general levelling-up of wages throughout the agricultural industry. It had forced the inefficient employer to pay wages more closely in line with the wages paid by the efficient employer in the same district, and it had gone far to eliminate whole pockets of low wages in the more backward areas. This stepping-up process may be regarded as the task of raising wages to their economic level. As a result wage rates have advanced throughout the country, but the greatest advance has been in those areas which, previous to 1924, had the lowest rates of pay. The danger of a statutory national minimum wage, from the worker's point of view, is that it is apt to be regarded as a maximum. There is evidence, however, that the more progressive farmers pay rates above the minimum even to their general workers. The wages of special classes of workers such as tractor drivers, shepherds, stockmen and so on are subject to keen competitive influences which result in rates of pay well above the legal minimum. This combination of a minimum social wage for all workers with a competitive wage for specialists should make agricultural employment at once more secure and more attractive. Nevertheless, there is much to be said for the adoption of standardized grades of wages in agriculture were it only in order to bring the agritural wage structure more in line with that of other industries. The problem is not easy for, as already stated, most work in agriculture is more or less skilled and sometimes the general worker needs a higher degree of skill than the specialist.

Secondly, the regulated wage system has tended to undermine payments in kind, one of the characteristic features of the traditional wages contract in farming. These perquisites take a variety of forms, such as free cottages, board and lodging, food and drink, haulage, potato ground, keep of cow or sheep and so on. At the present time the most important are board and lodging and the " tied " cottage, both of which are, of course, acutely connected with the bigger problem of rural housing. The " living-in " system is prevalent in the north and west of England, in Scotland and in Wales, while the " tied " cottage which comes and goes with the job is more common in the midlands and the south and east of England. Payments in kind may be regarded as survivals of the sharing-out system in agriculture. Farmers welcome them as a means of avoiding the payment of cash wages during seasons when there is little farm income. The workers also, in times when transport was primitive, were enabled to obtain goods and services which otherwise they could not have had. The great objection to this form of payment is, of course, that the dependence of the worker on his employer for home, food and employment seriously fetters his economic freedom. Agriculture was excluded from the terms of the Truck Acts under which perquisites in other industries had to be regarded as additions to wages. But under the Agricultural Wages Board all recognized perquisites are now valued and reckoned as payment of wages in lieu of payment in cash for the purpose of any minimum rates of wages.

Thirdly, there may be some danger that the adoption of this strictly cash status tends to weaken the old personal relationship between master and man, and thereby lessens the worker's interest in the farm and its activities. Luckily the character of farm work is such that, as compared with other industries, there is much less danger of the worker losing that pride of job which is the surest basis for real interest. Nevertheless, there is room in agriculture, as in other industries, for the extension of methods of payment calculated to increase the worker's interest and initiative by more directly relating his cash reward to the value of the finished product.

In this connection it is sometimes advocated that piece-rates are superior to time-rates because they vary directly with the worker's effort. In agriculture piece-rates are mainly restricted to casual workers employed in crop husbandry. These may be semi-skilled workers engaged on such jobs as hoeing, singling, lifting roots, the picking of peas and similar jobs especially on market-garden holdings. The objection to piece-rates here is the possible incentive to scamp work at the expense of quality. Moreover, higher time-rates coupled with defined overtime pay have lessened the attraction of piece-rates to the worker himself. It is very different in the case of the other type of casual workers, i.e. the skilled craftsmen, such as hedgers, thatchers and threshers, who ply a fairly regular trade from farm to farm. With these, piece-rates have proved to the advantage of both worker and employer. As already stated the Wages Board has now powers to fix rates on a time-work basis for workers employed on piece-work.

In a different category are the various profit-sharing and co-partnership schemes which are not unknown to agriculture, though there are serious hindrances to their general adoption. Thus profit-sharing schemes are of doubtful advantage to workers in an industry where profits are notoriously unstable and irregular. The essence of co-partnership is joint control by employers and workers, but farming with its dependence on natural processes is an industry which requires a flexible executive capable of giving quick decisions.

Much more in keeping with the nature of agriculture is the special reward of good work and industry by the payment of special bonuses. In livestock farming the payment of such bonuses is an old established custom, e.g. lamb money to the shepherd, calf money to the cowman and so on. It is not always clear, however, how far these payments in the past represented higher wages or payment for overtime. Of a different type are the bonuses calculated on the *quality* of work done, and which are being increasingly adopted by the more progressive farmers. Examples of this latter type are bonuses on the number of pigs weaned per litter, the number of calves reared, the number of lambs tailed, the bacterial count of milk and so on. It is not so easy to introduce bonus payments in crop husbandry, though the use of machinery has been made the basis for doing so on some farms. For example, the tractor-driver-mechanic may be paid a bonus for keeping his repairs bill below a stated figure, or on the acres ploughed, or rolled, or harrowed per day at the critical periods of the year.

Fourthly, the advance in wage rates together with the employer's premiums and contributions for accident, health, pension and unemployment insurances have resulted in a substantial increase in both the actual and the relative importance of labour costs on farms employing hired workers. This means that the dependence of the non-family farm on an ample and cheap supply of hired hands has come to an end, and these farms must be adjusted to the new economy of high wages. On some farms high wages have forced the most inefficient managers out of business. On others, especially those employing one or perhaps two hired workers, steps have been taken to enable the family workers to cope with the work so as to dispense with regular hired help. On the farms where the hired workers form the core of the labour force higher wages have acted as a stimulus to improved management and organization, and in particular have led to the greater use of capital equipment, to greater concentration on higher-priced products and to the avoidance of products such as roots which yield a relatively low output per unit of labour.

Fifthly, the extension of unemployment insurance to hired workers in agriculture may have tended to the greater casualization of workers especially in arable areas: but the war conditions which have intervened since the introduction of the scheme make it difficult to form a judgment on its influence in this respect. In theory, however, unemployment insurance has relieved the employers of the obligation to maintain a large staff of workers during both slack and busy seasons. From the workers' point of view, the inclusion of hired farm workers in a scheme of unemployment insurance has removed a serious anomaly of status.

Lastly, the administration of the Wages Board as well as the various insurance schemes has acted as a spur to the development of trade unions amongst agricultural workers. Thus the representatives of the workers on the Central Wages Board and on the county committees are usually selected from union officials. As stated already the unions have been active in helping to police the minimum wage regulations, while several of the insurance benefits are also paid through the medium of the unions. But it is possible that the machinery of the Wages Board has helped to obviate resort to the harsh sanctions of the strike and the lock-out which have been more or less prominent features of the growth of trade unions in other industries.

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CHAPTER VI

COMBINATION OF THE FACTORS OF PRODUCTION

In the three preceding chapters some of the more important economic features of the use in agriculture of the three factors of production—land, capital and labour—have been considered in turn and largely independently of each other. But it is the job of the farmer to use these three factors *in combination* on the farm, for the three factors must be used together before production can take place. In doing so the farmer has two distinct functions to perform. In the first place, in his role of entrepreneur, or proprietor of the farm business, he is responsible for the general policy or plan on which his business and his system of farming is based. In the second place, in his role of chief executive, or farm manager, he is responsible for the administration of that plan. Both functions are concerned with the fundamental problem of ascertaining and adopting the optimum combination of the land, the capital and the labour at the farmer's disposal. Under any given set of circumstances the optimum combination is that which will enable the farmer to obtain the maximum financial output for the minimum financial input *from his farm as a whole*. The given set of circumstances will be conditioned by the size of the farm and the size of the business, by the system of land tenure, by the methods of buying and selling and by the price-levels of the inputs and the outputs. These conditions are considered in turn in later chapters. The present chapter is concerned with two economic problems common to all farms under all sets of circumstances, namely, the problem of the degree of specialization of production and the problem of the degree of intensity of production to be followed.

SPECIALIZED AND DIVERSIFIED PRODUCTION

This first problem involves major decisions on the system or type of farming. The practical problem here is the choice of crops to grow and the choice of livestock to keep. Up to a point this practical problem will be determined by the physical conditions of soil, climate and so forth. The economic problem behind the practical problem involves the decision whether to concentrate on the production of one or two commodities or whether to produce many commodities. In other words, it is the problem of choosing between a specialized and a diversified system of farming.

Some idea of the variety of British agriculture was given in discussing the gross output of the industry in Chapter II and a list of the chief products sold by British farmers to their non-farming customers was given. The same variety is mirrored on the majority of the farms of the country, for there is nothing unusual in individual farmers selling up to a dozen or more products from their farms to their farming as well as to their non-farming customers.

But this is not to say that there is no specialization of production on the farms of the country. On the contrary, the tendency for British agriculture, in spite of the variety of its output, to concentrate on certain products is also reflected in the economy of individual farms. Thus it is possible to make a rough classification of the farms of the country into certain broad types according to their dominant enterprises, e.g. dairy farms, cattle-rearing farms, sheep farms, corn farms, pig farms, poultry farms and market-garden or horticultural holdings.

The problem of classifying farms is complicated by the variety of principles on the basis of which classifications can be made. From the economic standpoint perhaps the two more important bases of classification are (*a*) the number of sale products, and (*b*) the degree of self-sufficiency of the farming system.

The one-product farm, concerned only with one commodity together with its unavoidable by-products, is rare in this country. The nearest approaches are cow-keepers concerned only with milk production and poultry-keepers concerned only with egg production. Farms specializing on products of a " common origin " are more numerous. The products concerned may be of common origin in the sense of being joint products, or they may be common to a system of farming. Examples of the first category are poultry farms selling eggs and birds, or pig farms selling porkers, baconers and weaners. Examples of the second are market gardens, horticultural holdings, arable farms selling only farm cash crops and so forth.

The various types of specialist farms mentioned in the previous paragraph can be further sub-divided on the basis of the self-sufficiency of the farming system. For example, specialist milk producers may be concerned with only the final stage of milk production, buying all their farming raw materials, such as cows and feeding-stuffs, from other farms and using their own land merely as exercise ground for their milking herds ; or specialist milk producers may integrate most of the stages in the production of milk on their own farms, as on the so-called " self-contained " dairy farm where the farmer rears his own dairy stock and grows most of his own cow-food, and is therefore largely independent of the products of other farms since he himself produces his own farming raw materials.

Most farms in this country are best described, however, as non-specialist or general farms. But the term " general farm " covers a wide range of conditions. General farms may concentrate on one or two dominant enterprises, with one or more subsidiary sources of farm income. Or they may be farms with several enterprises, none of which has a preponderating influence in the farm economy, and which are not necessarily inter-related with each other in the system of farming. Or again they may be mixed farms proper, i.e. farms on which both livestock and crop enterprises are important and where, moreover, the livestock and the crops dovetail to form a technically interlocking system of mixed husbandry.

In classifying farms from the agricultural standpoint it is usual and useful to adopt two principles of classification: the kind of sale products and the ratio of arable land to pasture. These two principles of classification were used by the Ministry of Agriculture and Fisheries in preparing the *Types of Farming Map of England and Wales* issued in 1941.

This map distinguished the following 17 farming types:

I *Pasture Types (less than one-third of the farm land arable)*
- A Predominantly dairying
- B Dairying supplemented by other enterprises
- C Grazing and dairying
- D Rearing supplemented by several other livestock enterprises
- E Mainly rearing and sheep grazing

II *Intermediate Types (between one-third and two-thirds of the farm land arable)*
- F Mixed farming with substantial dairying side
- G Mixed farming with substantial rearing or feeding side
- H General mixed farming
- I Corn, sheep and dairying
- J Farming based largely on wheat and cattle
- K Other intermediate types, with fruit, vegetables or hops

III *Arable Types (more than two-thirds of the farm land arable)*
- L Mixed farming based on arable production
- M Mainly corn and sheep farming
- N Corn and sheep farming, supplemented by cash crops
- O Mainly cash crop farming
- P Market gardening
- Q Other arable farming types

It is important to emphasize that, although the above farming types may be broadly delineated, in practice the types show countless variations, and they are by no means stereotyped.

In other words, the terms "specialized farming" and "diversified farming" are essentially relative terms, and British agriculture illustrates the infinite stages which intervene. At the one extreme is the specialist farm which tends to concentrate on the production of one commodity and having only one major source of farming income. At the other extreme is the mixed farm with its complex variety of activities and selling a dozen or more commodities. In between come all stages of specialization and of diversification.

In theory, most of the advantages of specialization in agriculture are identical with the well-recognized advantages of specialization in manufacturing industries generally. In the first place specialization should lead to improved technical efficiency since it makes it possible for the farmer to concentrate on the problems of producing a single commodity only. In this connection it also leads to increased co-operation between the scientist and the farmer—the farmer finding it easier to apply the resources of science and the scientist finding it easier to have access to the empirical knowledge of the farmer. Secondly, in so far as specialization is identical with the adoption of a simple system of farming, it facilitates the adoption of a routine and thereby leads to the simplification of management. Thirdly, specialization may, in certain circumstances, make it possible to gain some of the advantages of large-scale farming, such as the use of more specialized labour and equipment, without actually increasing the size of the farm. Fourthly, specialization tends to make for better business methods generally, and especially better marketing arrangements as a result of the increase in the volume of sales and the better grasp of conditions of demand and supply when dealing with one or two commodities only. Finally, under certain circumstances specialization may make it possible to exploit outstandingly favourable conditions of soil and climate especially where these are homogeneous in character over large areas. In this country, however, the heterogeneous conditions of soil and climate which exist put strict limits to this possible advantage of specialization. But it is possible even in this country for unfavourable physical conditions to impose specialization by limiting profitable production to a single enterprise, e.g. sheep on rough mountain grazings.

Many of the advantages of diversification, on the other hand, spring from certain dangers which appear to be inherent in specialization itself, especially in its extreme form of monoculture. This is a situation more or less peculiar to agriculture and resulting from the organic complex of the producing unit in farming. It is closely related to the intricate technical problems of the maintenance of soil fertility and its relation to the health of plants and animals. Thus it is generally accepted that some rotation of crops is necessary for the maintenance of soil fertility. The presence of livestock is also held to be a great advantage as a means of restoring the fertility taken away by the crops. Moreover, continuous reliance on a single crop or on one type of livestock greatly increases the risk of attacks from pests and diseases. These problems and these risks are easier to cope with in the more diversified systems of farming.

A second advantage of diversification is the opportunity it gives for the utilization of by-products, and by-products are an important feature in the production of most farm commodities. For instance, tail corn can be fed to poultry, poor-quality barley or skim milk to pigs and sugar-beet tops to sheep and cattle. In this way otherwise unsaleable by-products can be cashed and made to increase the income of the farm as a whole. Incidentally this explains why many products can be profitably grown on certain farms even though on an accounting basis they hardly seem justified. Diversified farming also gives scope to livestock, especially poultry and pigs, to play the role of scavengers and thus establish side-lines capable of competing successfully with the commercial specialists.

Thirdly, growing several products either for the use of the farm family or as raw materials for the sale products of the farm renders the farmers concerned less dependent on external conditions of supply and prices. For example, farmers may produce their own motive power by rearing and using their own horses. livestock farmers may grow all the feeding-stuffs for their animals, crop farmers may grow their own seeds and produce their own manures in the form of muck and leguminous crops and so forth. This kind of integration of the different stages of production on the same farm also eliminates the costs of transporting the intermediate products, while under certain conditions it might even be the only means of obtaining them.

Fourthly, the growing of both crop products and livestock products on the same farm enables the farmer to spread both his income and his risks. Thus, while the returns in crop husbandry tend to be concentrated into a short period of a few weeks only, livestock receipts (especially from milk, poultry and pigs) can be organized to bring in a fairly regular income throughout the year. Again by heeding the old adage against putting all one's eggs in one basket the diversified farmer is minimizing the risk of possible failures from price fluctuations, from weather vagaries and from diseases and pests. Moreover, the greater flexibility of a mixed system of farming permits the farmer to expand or contract his production of the various products in keeping with changes in their cost-price relationships.

Finally, perhaps the most important of all the benefits of diversification is the opportunity it affords of utilizing to the fullest possible extent the available supplies of the agents of production on any one farm. In the case of land, diversification may enable two different crops to be grown on the same piece of land in one year, or it may be the only way in which land of varying qualities on the same farm can be fully used. The possibilities for fuller utilization are even more pronounced with equipment and labour, for combinations of crops or combinations of crops and livestock can be devised to dovetail in their demands for men and machines so as to keep these fully employed throughout each day and from season to season. This fuller use of the means of production enables the farmer to produce each product at a lower cost than would otherwise be possible because certain fixed charges such as the rent of land, cost of equipment and wages of the permanent staff will be spread over a bigger gross output. In other words, it is often easier for the farmer to achieve the aim of lowering unit costs of production through diversification (i.e. through producing several products), whereas the factory manager almost invariably attempts this by increasing his output of one commodity only.

It is the task of the farmer to plan his system of farming so that as many as possible of the advantages of both specialization and diversification can be obtained. In practice this is often best achieved by guarding against the dangers of either extreme. On the one hand, over-specialization may lead to serious technical difficulties, and is always liable to a high degree of financial risk. On the other hand, too much diversification may defeat its own object if it fails to apply specialized knowledge and merely results in dissipating labour and capital which might be better concentrated on fewer enterprises. It is in striking a balance between these two extremes that it is important to regard the farm as a co-ordinated whole wherein all the processes are interdependent and all the enterprises are well-fitting and articulated parts.

In this connection the conventional designation of enterprises as being either competitive, supplementary or complementary is a most useful guide to general policy.

In a sense all farm enterprises compete with each other in their demand for the available land, labour and equipment. But the degree of competition between enterprises differs considerably. For example, crops grown in the same season, such as wheat and barley or potatoes and sugar-beet, are competing at almost every stage for land, for labour and for cultivating and harvesting equipment. Such directly competitive enterprises tend to crowd each other out of any farming system.

Other enterprises, however, far from conflicting with one another, actually render it possible to make fuller use of the available supplies of the agents of production on any one farm. Such enterprises are said to be *supplementary.* For example, winter corn and spring corn are supplementary in respect of labour and machinery, while catch crops are supplementary in respect of land. Again, as stated already, combinations of crops and livestock are often devised for the very purpose of evening out the seasonality of farm work throughout the year. Lastly, most side-lines, such as pigs and poultry on the general farm or a small dairy herd on an arable farm, supplement the major enterprise by utilizing some spare land or some surplus labour or some odd building which would otherwise be idle.

Still other enterprises are said to be *complementary* when one enterprise makes a contribution to the success of the other. This contribution may or may not be mutual, but together the enterprises concerned add interdependently to the profits of the farm as a whole. Agriculture abounds with illustrations of this complementary relationship. The classic illustration is supplied by the old Norfolk four-course system where the complementary relationship of the crop enterprises and of the livestock enterprises were such that the final products were largely of the nature of joint products.

These different categories of qualitative relationships give a clear guide to the farmer in deciding on the number and type of enterprises to include in his farming system. It is obvious that he should aim at eliminating the more directly competitive enterprises, while exploiting to the full the advantages of combining those enterprises which supplement or complement each other most effectively.

Intensive and Extensive Production

After deciding what crops and what livestock to have on his farm, the farmer has to decide next on the methods of producing each of his crop and livestock products. There is a wide variety of choice here, for there is no set technique for the production of any one farm product. To illustrate, suppose a farmer has decided to produce two commodities, wheat and milk—one a crop product and the other a livestock product. In producing his wheat he can use a large or a small area of land, he can sow one or more of many varieties of seed, he can manure heavily or lightly, he can practise the maximum or the minimum of cultivations and he can carry out his operations with horses or with tractors. Likewise, he may produce his milk from a small pedigree herd or from a large commercial herd chosen from one or more of many breeds, he can feed his cows with all kinds of different rations, he can milk them by hand or by machine and he can house them or keep them out of doors. In other words, at almost every stage in the production of his wheat and his milk the farmer is faced with the necessity of making a choice between many alternatives.

Technically all the alternatives are feasible, but from the economic point of view some are better than others. The ultimate decision therefore must be an economic decision. It will be concerned with ascertaining and adopting the optimum combination of the factors of production to be used in each of the enterprises on the farm. The optimum combination is that which will enable the farmer to produce his wheat and his milk with the greatest profit. In endeavouring to do this he will tend to use more of one factor if its cost in relation to its efficiency is less than that of the other factors. On the other hand, if one factor becomes relatively more expensive than the others he will tend to use it more carefully. For example, if land becomes relatively more expensive the farmer will tend to produce his wheat and his milk by using more labour and capital on less land. Similarly if labour becomes relatively more expensive he will tend to use more capital in the form of machinery to produce both his wheat and his milk.

In this way, as the relative costs of the factors of production change, one factor will tend to be *substituted* for another so that the farmer continues to obtain the biggest net returns from each of his enterprises. Now changes in the relative costs of the factors of production reflect changes in their relative scarcity or plenty, so the problem involved is the universal economic problem of the best utilization of scarce resources. The so-called *law of substitution* enunciates the principle that the farmer should use as few inputs of the more expensive resources and as many inputs of the cheaper resources as possible to obtain the desired product.

Looked at from another angle the problem may be stated as the problem of ascertaining the degree of intensity with which any one factor can be combined with the other factors in the producing process. Thus in our illustration the farmer may use the greater part of his land to produce wheat *extensively* using only the minimum of labour and capital ; or he may produce his wheat *intensively* from a smaller area but with lavish use of labour and capital. Similarly, he may produce his milk by the *extensive* feeding and management of his cows, or he may produce it by the *intensive* feeding and management of his cows.

Because in this country the farmer has little chance of altering the size of his farm (i.e. altering the amount of land he uses) this problem of intensity is generally discussed in terms of the size of the unit of production. But it arises whatever the size of the farm, for it arises every time the farmer changes the amount of land or labour or capital which he uses in any one of his farm enterprises.

INFLUENCE OF DIMINISHING RETURNS

The law of diminishing returns has an important bearing on the farmer's freedom to vary the relative degree of intensity with which he uses land, capital and labour in the processes of production. One aspect of this law has already been mentioned in the discussion of land in Chapter III. In its simplest form it is defined by Marshall as follows : "An increase in the capital and labour applied in the cultivation of land causes *in general* a less than proportionate increase in the amount of produce raised unless it happens to coincide with an improvement in the arts of agriculture." But the law holds good too when capital or labour and not land is the fixed or constant factor. The essence of the law is that in the process of producing any product successive inputs of any one factor applied to fixed amounts of the others will, after a certain point, tend to produce a diminishing increment of output for each additional unit of input.

It is customary and useful to illustrate the principle of diminishing returns on the physical level and then translate the illustration into its economic counterpart. The conventional illustrations given by most economists are taken from agriculture, and the growing of wheat in a given stage of development of technique is a general favourite. For simplicity, two factors only—land and labour (each of uniform quality)—are taken, and the illustrations show the assumed variations in the yield of wheat obtained from a fixed area of land by changing the amount of labour used in its growing. Suppose the results are as shown in Table VII although the figures there are arbitrary and have no reference to concrete cases.

TABLE VII—Illustration of increasing and diminishing physical returns from the application of varying inputs of labour to a fixed area of land in the production of wheat

Inputs of Labour	Total Outputs of Wheat	Marginal Output
Days	Cwt.	Cwt.
1	1	—
2	3	(3–1) = 2
3	6	(6–3) = 3
4	11	(11–6) = 5
5	18	(18–11) = 7
6	26	(26–18) = 8
7	33	(33–26) = 7
8	38	(38–33) = 5
9	41	(41–38) = 3
10	44	(44–41) = 3
11	45	(45–44) = 1
12	45	(45–45) = 0
13	44	(44–45) = –1

The first and second columns of the table show the connection between the total inputs of labour and the total outputs of wheat; e.g. with 1 unit of labour (i.e. 1 day's work) an output of 1 cwt. of wheat was obtained, with 2 units of labour the output was 3 cwt., and so on. Thus as the input of labour was increased so also was the output of wheat. But the increase in output was not at a uniform rate for, after increasing rapidly for some time, the rate of increase slowed down until it stopped altogether when eleven units of labour had been used.

The explanation of this trend in the rate of increase of the total output is given by the figures in the third column of the table. It is with these figures of *marginal output* that the law of diminishing returns is concerned. The marginal output can be defined as the addition to the total output which is obtained each time an extra unit of input is used. For example, when the inputs of labour were increased from 3 to 4 units, the total output of wheat went up from 6 cwt. to 11 cwt. The difference between these two outputs, i.e. 5 cwt., was the marginal output of labour when 4 units of labour were used. This is not the same as saying that the marginal output was the output obtained from the fourth unit. It was the additional output obtained when 4 units rather than 3 units of labour were used.

The marginal outputs shown in the third column of the table also exhibit a tendency to increase up to a maximum, then fall off and ultimately become negative. In other words they go through a phase of *increasing returns*, which is followed by a phase of *diminishing returns*. It will be seen that the point of maximum marginal output was reached some time before the point of maximum total output. It will be seen also that the shorter phase of increasing marginal outputs coincided with the phase of the most rapid rate of increase in the total output. But as soon as the marginal output started to diminish (i.e. with 7 units of labour) the rate of increase of the total output started to slow down until the total output also stopped increasing altogether at the point when the marginal output became zero. Thereafter the marginal outputs became negative, which means that additional inputs of labour were not only wasted but were actually harmful for they resulted in lowering the total output of wheat obtained.

This tendency towards diminishing marginal physical outputs is, after all, only what our common sense would lead us to expect. All that it means is that it cannot be assumed that doubling the amount of labour on any one field will double the yield of crop obtained from that field. What applies to inputs of labour applies also to inputs of capital, for likewise it cannot be assumed that doubling the amount of manure applied or doubling the quantity of seed used will double the crop yield. Moreover, this physical law of diminishing returns applies not only to crop husbandry but also to livestock husbandry ; e.g. doubling the cow's ration will not necessarily double the yield of milk obtained. Indeed there is a large body of experimental data as well as of practical experience to support the view that the tendency for diminishing marginal physical outputs is universal in all aspects of farming, applying both to crop and to livestock production.

The economist has to translate this physical phenomenon of increasing and diminishing outputs into its economic counterpart—the law of increasing and diminishing returns. This is done by expressing both the physical inputs and the physical outputs in monetary terms. Thus, in the illustration, the inputs can be expressed in terms of the cost of labour used and the outputs in terms of the value of wheat produced. Suppose his labour cost the farmer £1 a day and that he obtained 10/- a cwt. for his wheat. The financial series of inputs, total outputs and marginal outputs can then be set out as shown in the first three columns of Table VIII.

It will be seen that as the cost of labour was increased (i.e. as more labour was used) the series of total returns and the series of marginal returns followed exactly the same trends as their physical counterparts, i.e. the series of total outputs and the series of marginal outputs respectively.

Because of this it would have been foolish for the farmer to endeavour to reach the maximum total returns of £22 10/-. To do so he would have had to use 11 units of labour. But

TABLE VIII—Illustration of increasing and diminishing economic returns from the application of varying inputs of labour to a fixed area of land in the production of wheat

Costs of Labour (Inputs)	Total Returns			Marginal Returns		Total Net Returns	
£	Cwt.	£	s	£	s	£	s
1	1	0	10	–	–	Loss	
2	3	1	10	1	0	Loss	
3	6	3	0	1	10	Nil	
4	11	5	10	2	10	1	10
5	18	9	0	3	10	4	0
6	26	13	0	4	0	7	0
7	33	16	10	3	10	9	10
8	38	19	0	2	10	11	0
9	41	20	10	1	10	11	10
10	44	22	0	1	10	12	0
11	45	22	10	0	10	11	10
12	45	22	10	Nil		10	10
13	44	22	0	– 0	10	9	0

using 11 units of labour instead of only 10 units would have added £1 to his costs but only 10/- to his returns. In other words the *marginal return* from labour would have been less than the cost of the *marginal input*. The farmer would therefore have incurred a loss in respect of that marginal input, with a corresponding reduction in his total profits from £12 to £11 10/-.

The farmer would also stand to lose if he had been content to use less than 10 units of labour, for that would have meant that he was not fully exploiting his chances of profit. If, for example, he had used only 9 units of labour instead of 10 units he would have had to be content with a total profit of £11 10/- instead of the £12 possible.

It follows, therefore, that the point of optimum intensity for the use of labour was reached with an input of 10 units, i.e. *at that point where the cost of the marginal input was just covered* *by the value of the marginal output.* A higher intensity of labour input would have resulted in a smaller profit, and a lower intensity would have failed to secure the maximum profit possible. This simple illustration conveys the essence of the general principle of intensity in farming, which can be expressed as follows. In the production of any given product the optimum degree of intensity with which any one factor can be used in combination with fixed quantities of the other factors is reached when the cost of the marginal input of that factor is equal to the value of its marginal output.

The farmer who has more than one enterprise on his farm has got to consider the problem of intensity not in the light of the profits from one enterprise only, but in the light of the profits *from the farm as a whole.* This complicates the problem since, his resources being limited, the farmer can only use more of them in one enterprise at the expense of the other enterprises. For example, in producing his wheat the farmer might be working under conditions of increasing returns, that is, he could use more labour or capital than he is doing and still make a profit on the extra or marginal input. But this would mean taking labour or capital away from his dairy enterprise thereby reducing his profits from milk production. In other words in increasing his profits from wheat he would have to forego or sacrifice some of his profits from milk. This sacrifice of a rival opportunity is called *opportunity costs.* Some economists claim that opportunity costs are the only real costs, e.g. the real costs involved in using labour and capital in growing wheat are due to the fact that the same labour and capital cannot be used to produce milk. The farmer must decide, therefore, whether spending more on growing wheat is going to increase his profits by a greater amount than they will be reduced by spending less on producing milk. The optimum situation will obtain when the *marginal return* of any one factor will be the same for both the wheat enterprise and the milk enterprise. The marginal return, moreover, is not static, for it will vary according to the relative prices of the factors and of the products.

This marginal analysis depending on the cost-price relationship and leading to *the principle of equi-marginal returns* is fundamental to all economic decisions in farm management. In the ordering of his affairs the farmer will find it capable of an infinite variety of applications.

Costs and Output

So far costs have been mentioned incidentally, but in practice the farmer generally thinks of the problem of intensity in terms of his costs of production. Up to a point he is right in doing so, for the tendencies towards increasing and decreasing returns have, in a sense, their counterparts in tendencies for decreasing and increasing costs. Thus, so long as the farmer is producing wheat under conditions of increasing returns it means in effect that, as he intensifies his production, he is also reducing his costs per unit of product, i.e. his costs per cwt. Conversely, when he is producing wheat under conditions of diminishing returns, as he intensifies his production he is increasing his costs per cwt. of wheat produced.

The figures given in Table VII and in Table VIII can be rearranged to illustrate this connection between the trends of outputs or returns and the trends of inputs or costs. This is done in Table IX where the wheat outputs and the labour costs incurred in producing the outputs are put in juxtaposition in the first two columns of the table. The fourth column gives the labour cost per cwt. of wheat produced at the various levels of intensity, the figures being obtained by dividing the figures of total costs by the corresponding figures of total outputs.

The table shows that when only 1 cwt. of wheat was produced the cost was 20/- per cwt., but when the yield increased to 3 cwt. as a result of using more labour, the cost per cwt. fell to 13/4. The cost per cwt. continued to fall as the yield responded to more and more inputs of labour until it reached its lowest cost of 4/2 per cwt. when the total output was 38 cwt., obtained by an expenditure of £8 on labour. From there onwards, however, the labour cost per cwt.

TABLE IX—Illustration of decreasing and increasing unit costs from the application of varying inputs of labour to a fixed area of land in the production of wheat

Inputs or Cost of Labour	Outputs of Wheat		Labour Costs per Cwt. of Wheat	Total Net Returns
	Total	Marginal		
£	Cwt.	Cwt	s d	£ s
1	1	—	20	Loss
2	3	2	13 4	Loss
3	6	3	10 0	Nil
4	11	5	7 3	1 10
5	18	7	5 7	4 0
6	26	8	4 7	7 0
7	33	7	4 3	9 10
8	38	5	4 2	11 0
9	41	3	4 3	11 10
10	44	3	4 7	12 0
11	45	1	4 11	11 10
12	45	0	5 4	10 10
13	44	− 1	5 11	9 0

produced starts to rise. It is the advent of diminishing physical returns which explains this change in trend. In other words once the rate of increase in the physical output failed to keep pace with the rate of increase in total costs the factor responsible for the early trend of lower unit costs disappeared.

It will be noticed that the point of transfer from decreasing to increasing costs does not coincide with the point of transfer from increasing to decreasing output but comes somewhat later. The lag is explained by the fact that while the intervening extra inputs of labour add less to the total output than their immediate predecessors they still add enough to bring down the average unit cost. It will also be noticed that the point of highest total net returns does not coincide with the point of lowest unit cost. In fact in order to obtain the highest net return the farmer would be justified in producing at a unit cost of 4/7 per cwt., which is slightly above the lowest unit cost possible.

The practical point to grasp, however, is that the last additions to a high-yielding crop tend to cost more and more and the farmer needs to make certain that in striving for higher yields he does not pass the point of optimum operation. The advent of decreasing physical output is the sign that that point is near. This means that the prevalent belief that high yields make for lower unit costs is not universally true, it depends entirely on whether production is in the phase of increasing or of decreasing physical returns.

In the above illustration it has been assumed that labour is the variable cost factor, but the other items of costs in respect of land (i.e. rent) and capital (i.e. seeds, manures, etc.), so far assumed to have been constant, must also be considered. When these other items are brought into the picture the reduction in the total cost per unit of product during the phase of increasing physical returns is still more pronounced. The simple reason for this is that as these costs, which have been assumed to have been fixed, are spread over a larger number of units of product, the share per unit becomes smaller and smaller. The fixed costs are often called *overhead costs* to distinguish them from the variable or *prime costs.* The distinction between the two is not clear-cut, but the point is that, in the short period especially, a change in the volume of output is brought about by a change in the quantity of prime costs and not by a change in the quantity of overhead costs. In other words, whereas the overhead costs remain more or less fixed irrespective of the quantity produced, the prime costs change more or less with the quantity produced.

In the production of most crop products the overhead or constant costs form a relatively larger part of the total costs than do the variable costs which influence the quantity produced. For example, if a farmer decides to produce wheat at all a field must be set aside for the purpose, the minimum of cultivation must be carried out, a minimum quantity of seed must be sown and the crop must be harvested before any wheat at all is obtained. In other words certain expenses represented by the rent of the field and the cost of the minimum inputs of labour and seed must be incurred The rent of the field is obviously a fixed cost, but, from the practical standpoint, the other costs mentioned are also fixed since they must be incurred once the decision to grow wheat is made, and they are not affected by the yield obtained.[1] Other things being equal the farmer would stand to gain very much by being able to spread these more or less basic costs over as large an output of wheat as possible. He will endeavour to increase his output by increasing his inputs of labour and capital over and above the minimum inputs necessary to grow any wheat at all ; e.g. he will use more labour by cultivating more thoroughly, he will use more capital in the form of more or better seed or in the form of fertilizers and so forth. But the farmer's ability to increase his output of wheat from any one field by increasing the inputs of these variable costs is strictly limited by two factors. One of these is the incidence of diminishing physical returns discussed above. The other is the fact that the farmer can obtain only one crop of wheat from his field in any one year. Stated in another way this means that the scope for the farmer to lower his unit costs of production of wheat through spreading his overhead costs over an increasing output is strictly circumscribed.

Much the same conditions apply to the production of livestock and of livestock products, though here the farmer has somewhat better control of the volume of output. For example, if a farmer decides to produce milk at all, he must keep a cow and he must maintain the cow in health and in production. The costs of doing so may be termed the *maintenance costs* and they form the bulk of the total costs of producing milk. Moreover, these maintenance costs are more or less constant for all levels of milk yield. It follows, therefore, that as the milk yield per cow is increased the costs per gallon will fall because the maintenance costs are distributed over a much larger number of gallons. But there is a limit to the process because sooner or later diminishing physical returns set in in milk production also, and there is, of course, no question of increasing the yield per cow indefinitely Moreover, in milk production as in crop production the point of maximum yield does not necessarily coincide with the point of minimum cost per unit produced.[1]

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[1] Fluctuations in yield due to climatic conditions are not considered here, and they do not affect the argument.

It follows, therefore, that both in crop production and in livestock production the farmer, in contrast to the factory producer, is not free to increase his turnover by increasing his variable inputs except within strictly circumscribed limits. Stated in another way this means that there is much less scope for the farmer than for the manufacturer to lower his unit costs of production by increasing his output of any one commodity.

In view of this limitation it is important to emphasize once again that the farmer has to consider his costs and his returns, or his inputs and his outputs, not in terms of the separate enterprises on his farm but in terms of his farm as a whole. The conception of overhead and variable costs are of even greater significance in this connection. Thus the farmer has certain charges to meet which go on regardless of the amount the farm produces. For example, he must pay his rent, he must remunerate his regular staff and he must procure and maintain his implements and machines. These are his general overhead costs and, moreover, they account together for the bulk of his total production costs regardless of the amount produced. This being so the farmer should clearly aim at increasing his total output (i.e. his sales) from the farm as a whole so as to obtain as big a margin as possible over and above these relatively fixed charges.

In doing so the farmer may produce one or two commodities or he may produce many more. He will, of course, aim to produce each commodity in a technically efficient way ; i.e. he will aim, within limits, at high yields and at low unit costs. But high yields and low unit costs per product will not be ends in themselves, they will only be means to an end. In other words, the farmer's final concern is not with the profit he obtains from any one of his enterprises as such, but with the contribution which each enterprise makes to the profit of the farm as a whole. It may well be that, on a strict accountancy basis, an enterprise may give only a moderate return or it may even show a loss, and the product concerned may be produced at a relatively high unit cost Nevertheless, the enterprise will still justify its inclusion in the farming system if it makes an essential contribution to the general farm economy. If it is a complementary enterprise it may do this by helping the other more "profitable" enterprise it complements. If it is a supplementary enterprise or a mere side-line it may make its contribution by helping to reduce the general overhead costs of running the farm as a whole.

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[1] A. Bridges, *Milk Production* (Oxford 1943), pp 41–6

The practical implication of the above reasoning is that technical efficiency in farming is not necessarily synonymous with economic efficiency. Technical efficiency can be measured in many ways : it can be measured in terms of the output of individual crops or livestock, i.e. in terms of yield per acre or per animal unit ; or it can be measured in terms of the cost per unit of product. i.e. in terms of the cost per cwt. of crop or per gallon of milk and so forth ; or it can be measured in terms of the output obtained from any one of the factors of production, i.e. in terms of output per acre, or per man, or per £1 of capital investment. Economic efficiency, on the other hand, must be measured by a comprehensive index of the economic utilization of all the factors used. In other words, economic efficiency must be measured in terms of the value of the total output of the farm as a whole expressed as a function of the combined cost of the total inputs of land, capital and labour used in its production.

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CHAPTER VII

THE SIZE OF FARMS

IN the previous chapter the discussion was centred on the internal organization of the farm as the producing unit of the agricultural industry. It is now necessary to discuss the factors which have determined the general pattern of the producing units themselves. In particular the numbers of farmers and the sizes of farms must be considered as well as the relative merits of large-scale and of small-scale farming, and from this to the inter-play of the factors which determine the optimum size of farm under varied conditions.

NUMBER OF FARMS AND FARMERS

According to the official *Agricultural Statistics* there are approximately 436,000 agricultural holdings of all kinds in Great Britain. The term "holding" as used in this connection includes every tract of agricultural land exceeding one acre in extent, and in respect of which the occupier has to make an annual statutory return at the 4th June agricultural census. The total number of *holdings* as given in the official statistics is, therefore, considerably in excess of the total number of *farms* in the country. There are two main reasons for this difference. First, many persons occupy more than one holding and separate returns may be made for each. It is true that the instruction for England and Wales is "to make a separate return for each holding only if each is farmed separately," but for Scotland each detached portion of a farm is returned separately. Second, for the purpose of the returns agricultural land is defined to include land used as "grazing meadow or pasture land or orchard or any land used wholly or mainly for the purpose of the trade or business of a market gardener or nurseryman." The returns, consequently, and quite properly, include a large number which are in respect of odd parcels of land which are not farms at all but which are used only incidentally for farming or are used for a great variety of non-agricultural purposes.

It is necessary, therefore, to make some estimate as to how many of these 436,000 holdings can be regarded as farms in the real sense of the term, i.e. how many are agricultural units run for profit. It is also necessary to attempt to estimate how many of the persons completing the 4th June agricultural returns can be regarded as *bona fide* farmers. Such estimates are an essential preliminary to an appreciation of the real economic structure of the agricultural industry. Indeed it is remarkable that it is only very recently that comprehensive attempts have been made to arrive at any such estimates. There have been two such attempts: the first an analysis of the Scottish returns for 1927, and the second an analysis of the 1941 returns for England and Wales. The results of both analyses were reported on in 1945, and, in spite of some differences in technique, the two reports together provide a very valuable addition to our knowledge of the fundamental economic pattern of agriculture in Great Britain.

Although the Scottish analysis [1] is in respect of the 1927 returns, it is not likely that the background picture has altered to any major extent. A detailed examination of the 76,500 returns for 1927 showed them to be in the following categories:

	Number	%
Farms, small-holdings and market gardens	36,500	47·8
Supplementary holdings and crofts . .	25,300	33·1
Non-agricultural holdings	2,900	3·8
Landless holdings and ungroupable returns	3,100	4·0
Loss due to amalgamations	8,700	11·3
	76,500	100.0

These figures show that of the total returns made, 11·3 per cent were detached portions of other holdings, 3·8 per cent were not used for agricultural purposes and 4·0 per cent were classed as "landless holdings" and "ungroupable" returns. This makes it possible to segregate the holdings of agricultural significance. These numbered 61,800 and accounted for about four-fifths of all the returns. Of this number, however, 25,300 were classed as "supplementary holdings and crofts." This leaves a total of 36,500 holdings, of a size capable of yielding a livelihood to their occupiers. Presumably most of the occupiers of these 36,500 holdings could be legitimately described as professional farmers.

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[1] W. E. Heath, "A New Classification of Holdings," *S.J.A.*, vol. xxv, No. 3, 1945

The analysis of the position for England and Wales[1] is based partly on the 1941 June returns and partly on additional information collected for the war-time survey of farming. But, unlike the Scottish analysis, all holdings under 5 acres in size are omitted. In 1941 there were roughly 300,000 June returns for holdings of 5 acres and above, but roughly 9,400 of these were in respect of detached portions of other holdings, and these were therefore amalgamated with the appropriate parent return. The actual analysis was then based on a random but stratified sample of the returns for 290,600 holdings. Another important difference between the two sets of analyses is that the analysis for England and Wales was made mainly from the standpoint of the occupiers rather than the holdings, the occupiers being grouped according to the degree of their economic dependence on the land they occupied.

The result was to distribute the 290,600 occupiers concerned into six categories as follows:

Type of Occupier	Number	%
Full-time farmers	215,900	74·3
Part-time farmers	32,500	11·2
"Regular" spare-time farmers	25,600	8·8
"Occasional" spare-time farmers	2,900	1·0
Hobby farmers	7,600	2·6
Other types	6,100	2·1
	290,600	100·0

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[1] *National Farm Survey of England and Wales*, Chap. II

A brief explanation of these categories will bring out the full significance of the classification :

(*a*) *Full-time farmers* (including market gardeners, horticulturists and poultry-keepers) are persons fully engaged in farming their holdings and wholly or substantially dependent on them for a living.

(*b*) *Part-time farmers* are persons who regard farming their holdings as their major occupation and source of livelihood, though they have some employment in addition. Examples are farmers doing some outside hauling or contracting work, or farmers who are also tradesmen in a small way of business.

(*c*) " *Regular* " *spare-time farmers* are persons who have some full-time employment other than their farms which in most cases will be small in size. Examples are farm workers, miners, quarrymen, industrial workers, publicans, etc. who do a bit of farming in their spare time for profit, that is, as a means of supplementing their income. This class is particularly numerous in Wales and in the English counties of Salop, Stafford and Warwick. It is certain that the total number shown in this class is substantially reduced by the exclusion of the 1–5 acres size group from the analysis.

(*d*) " *Occasional* " *spare-time farmers* are mainly professional and business men who spend their week-ends and other occasional periods on their holdings which they farm *for profit* with the help of a paid manager or bailiff. Most of the 3,000 in this class were located in counties within easy reach of London.

(*e*) *Hobby farmers*, as the name implies, regard farming their holdings as a pastime and not as a profit-making business. In addition to the occupiers of residential holdings, this group also includes the occupiers of fully equipped farms who differ from the full-time farmer class only in their motive for farming. The hobby farmer is of relative importance only in certain of the southern and south-eastern counties of England, forming over 10 per cent of all occupiers in Surrey, Oxfordshire, Berkshire, Hampshire and East Sussex.

(*f*) *Other* (*miscellaneous*) *types* include the occupiers of accommodation land, home-farms, farms taken over by County War Agricultural Committees and farms run by educational and other institutions.

This comprehensive classification of occupiers fills an important gap in our previous knowledge of the structure of the agricultural industry in England and Wales. In particular it enables a distinction to be drawn between the numbers " of occupiers who are farming for business, i.e. for profit, as distinct from occupiers who hold agricultural land for a motive which is primarily non-commercial, such as the pleasure or amenity it affords (hobby farmers and occupiers of residential holdings), or who hold it in connection with some other trade or business (occupiers of accommodation holdings), or for educational or other social purposes." The first two classes of full-time and part-time farmers (and to a lesser extent the two groups of spare-time farmers) " may be regarded as unreservedly farming for business." Together these two classes number 276,900 and comprise 95 per cent of the total number of occupiers of holdings of 5 acres and above.

It is unfortunate that the differences of analysis noted above make it impossible to amalgamate the Scottish figures with the figures for England and Wales. Nevertheless, it is possible, for the first time, to state that there are at least 284,900 farm holdings in Great Britain (209,000 in England, 39,400 in Wales and 36,500 in Scotland)[1] in the occupation of persons who can be described as *bona fide* farmers, i.e. as persons who are wholly or substantially dependent on farming their holdings for their employment and income.

SIZE-DISTRIBUTION OF FARMS

It is necessary to keep the above analysis in mind in interpreting the figures of the frequency distribution of farms according to size as given in the official *Agricultural Statistics*. The classification for 1939 (the last year for which figures for England and Wales and for Scotland have been published) is summarized in Table X.

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[1] It is interesting to compare these totals with the following totals of "farmers" as given in the Population Census for 1931:

England 208,600	Wales 39,600	Scotland 46,000

TABLE X—Distribution of holdings in size-groups in Great Britain in 1939

Size Group	Total Gt Britain	Per cent			
		Gt Britain	England	Wales	Scotland
1–5 acres . . .	77,773	17·8	17·7	13·4	22·1
5–50 acres. . .	193,977	44·5	42·6	54 4	44·3
50–150 acres . .	109,055	25·0	25·5	27·0	21·4
150–300 acres .	40,914	9·4	10·4	4·7	9 0
Over 300 acres .	14,235	3·3	3·8	0·5	3·2
Total	435,954	100·0	100·0	100·0	100 0

Before discussing the significance of the figures in this table it may be pointed out that the general picture they present has not changed significantly during the whole period covered by the official statistics.[1] It is true that there has been some reduction in the total number of holdings ; it is also true that there has been some tendency for the extreme size-groups (i.e. those under 5 acres and those over 300 acres) to decrease numerically while the medium-sized holdings have become proportionately more numerous.[2] But the feature of the statistics of the size-distribution of farms has been their comparatively static character. Indeed, it is broadly true to say that no major changes have occurred in the numbers and sizes of the farms in this country since they were first laid out, the majority of them under the various enclosure acts of the late eighteenth and the early nineteenth centuries. In many ways this is one of the most remarkable facts about the agricultural industry in this country.

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[1] E. Thomas, " Changes in the size of agricultural holdings in England and Wales during the past 100 years," *P of I.C.A E.*, 1929

[2] The decrease in the number of small holdings has occurred notwithstanding the various attempts made to encourage their development by legislation. This legislation starts with the Small Holdings Act of 1892 followed by those of 1908, 1919, 1926 and 1931. Under these Acts County and County Borough Councils in England and Wales now hold approximately 467,000 acres of land for small holdings proper providing 28,700 holdings but a large proportion of these are, however, unequipped.

The average small scale of British farming is made very evident by the figures in Table X even after making full allowance for the inclusion of diminutive holdings consisting mainly of accommodation fields, allotments, large gardens and non-agricultural plots. Thus 62 3 per cent of all the holdings are less than 50 acres in size, while holdings of over 300 acres account for only 3·3 per cent of the total number. These proportions vary in different parts of the country, the diminutive holdings under 5 acres being relatively more prominent in Scotland[1] and the small holdings of 5 to 50 acres more prominent in Wales.

Broadly speaking the small and medium holdings predominate in all the Welsh counties, in the Highland counties of Scotland with the "crofting" system, in the pastoral counties of the west of England, in special areas of intensive culture such as the Holland Division of Lincolnshire and the Isle of Ely, and in the vicinities of all the large industrial towns. On the other hand, the larger farms are more prominent in the arable counties of Scotland, the downland counties of the south and especially in the predominantly arable farming areas of the eastern counties of England. All sizes of holdings, excepting the very largest, are found, however, in every county throughout Great Britain.

To a certain extent this geographical distribution reflects the well-known tendency for the smaller farms to be associated with intensive agriculture, while the more extensive types of farming require larger areas of land. An analysis of the 1930 statistics for England and Wales showed that 90 per cent of the 9,300 specialist poultry holdings in the country, and 88 per cent of the 24,900 specialist fruit and vegetable holdings were less than 20 acres in size. The National Farm Survey analysis of 1941 also showed that three-quarters of the 90,000 holdings primarily or substantially devoted to dairying were less than 100 acres in size. At the other extreme come the areas associated with corn and sheep, where holdings above 300 acres in size are relatively much more important.

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[1] This is partly due to the difference in the method of enumeration used in Scotland. But it is also partly due to the fact that only "cultivated land" is recorded so that many large farms in hill and mountain land may appear as small holdings in the size-classification used in the official statistics.

In considering the numbers and distribution of large farms it is necessary to remember that the official classification does not take the acreage of rough grazings into account, for it is based on the acreage of cultivated land only, i.e. on the acreage of crops and grass. In 1938 rough grazings amounted to about 16 million acres for the whole of Great Britain. In Scotland two-thirds, and in Wales three-fifths, of the total agricultural area is classified as rough grazings. The exclusion of these rough grazings does undoubtedly cause an understatement of the number of large farms as measured in terms of their total surface area. In this connection an expression of size in terms of total rent or rental value supplies some corrective, for rental value reflects both the quality and the quantity of land, and is therefore more inclusive than total acreage. According to the National Farm Survey of England and Wales about 40 per cent of all holdings of 5 acres and above have a total rental value of less than £50 per holding, while nearly two-thirds are under £100 ; less than 2 per cent have a total rental value of over £500 per farm.

It should also be remembered that although small holdings and small farms are of great numerical significance, yet they occupy collectively a relatively small percentage of the total farming area. Unfortunately it is not possible to give up-to-date statistics of this reverse side of the picture, for the acreage covered by the various size groups has not been stated in the official reports since 1924 for England and Wales, and since 1925 for Scotland. But on the fairly safe assumption that the general relationship has not changed significantly since then, the 30·5 million acres of crops and grass in Great Britain may be said to be divided between the various size groups in the following approximate proportions :

Size Group	Per cent of Cultivated Area	Per cent of Number of Holdings
1–5 acres	1·0	17·8
5–50 acres	14·9	44·5
50–150 acres	32·2	25·0
150–300 acres	29·0	9·4
Over 300 acres	22·9	3·3
	100·0	100·0

Thus altering the focus from numbers to acreage gives a totally different perspective, the broad-based pyramid of the classification by numbers being completely inverted when acreage covered is the test. On the one hand, holdings of under 50 acres in size which account for 62·3 per cent of the total number cover only 15·9 per cent of the cultivated area. On the other hand, holdings of over 150 acres in size which account for only 12·7 per cent of the total numbers cover 51·9 per cent of the cultivated land. The position can be summed up by saying that, at one extreme, less than one-eighth of the occupiers farm more than one-half of the land, while, at the other extreme, well under one-fifth of the land is shared by more than three-fifths of the occupiers.

This statistical picture of the structure of the agricultural industry makes it obvious that little meaning can be attached to general statements about the average size of farms in the country, especially if the average is obtained by dividing the total acreage of agricultural land by the total number of farms or holdings.[1] Such averages can only give a very misleading

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[1] This applies also to international comparisons, e.g. the average size of farms in selected countries at most recent census dates (1929–37) was as follows :

Japan	2·7 acres	U.S.A.	158 acres
Greece	9 acres	Canada	234 acres
Switzerland	15 acres	Ontario	119 acres
France	29 acres	Saskatchewan	408 acres
Denmark	39 acres	Argentine	266 acres
England	82 acres	Australia	665 acres

(See *I.J. of A.A.*, vol. i, p. 21)

picture, for the fact is that this country is not associated with any particular class or size of farm, big farms and small farms being found side by side in every part of it.

It is this existence of large numbers of producing units of different sizes which makes the conception of the "representative farm" in Marshall's sense of the "representative firm" still of value in the economic study of agriculture. This conception has lost much of its significance in the study of most other industries, since these are now run by a comparatively small number of very large producers. A definition of the "representative farm" in Marshall's sense would be that farm (or group of farms) which is representative of the farms which produce the bulk of the output of the agricultural industry.

In assessing the economic position of farming it is fundamentally important that the farms studied should be representative in the above sense. This is why the agricultural economist needs all the statistical information possible about the structure of the industry, for the selection of representative farms for study is fundamentally a matter of scientific sampling, which in turn is only possible in so far as the agricultural universe is itself reasonably well-defined. It is clear that any generalizations about farming in this country must be based, therefore, on data obtained from farms of all sizes, for agriculture is one of the few industries wherein neither large-scale nor small-scale producing units have proved their undoubted superiority in practice. That is why a discussion of the pros and cons of large-scale and of small-scale production is still a matter of great practical as well as academic interest to the agricultural economist.

LARGE-SCALE FARMING

The advantages of large farms in agriculture are, in the main, similar to the advantages of the large producing unit in other industries. Thus there are commercial and financial advantages as well as technical and managerial advantages in large-scale farming as in large-scale manufacturing.

The commercial and financial advantages of the large farm follow from the superior bargaining powers of the large farmer in buying supplies, in selling produce and in obtaining credit. The merchant who supplies the large farmer with his feeding-stuffs, fertilizers and other requisites values his custom not only because he buys more than the small farmer, but also because it is more convenient and cheaper to supply one large order rather than several small ones. Savings in transport, in handling and packing and in book-keeping may justify the merchant in giving the large farmer preferential treatment in prices, in discount and rebates, and in prompt dealing.

Corresponding advantages accrue to the large farmer when he, in turn, is the seller. Like the merchant, the farmer also finds it more convenient as well as more remunerative to sell his goods in bulk and in large quantities. Moreover, large supplies generally make it possible to practise some measure of grading which should, theoretically, result in a higher average price for all the goods sold.

Similar economies of scale occur in the financial sphere, for the large farmer is generally able to borrow money and obtain credit with greater ease and at less expense than can the small man. This easier financial situation, in turn, means that the large farmer is in a better position to buy his requirements when favourable opportunity occurs, and to hold his goods for sale at the most opportune time. In this connection the greater storage accommodation available on the large farm is a great help. In this way the commercial and financial advantages react on each other, and together they place the large farmer in a relatively very favourable trading position.

The technical and managerial advantages of the large farm, as of the large factory, result from the possibilities of a more effective utilization of the available supplies of the three factors of production.

In the first place, capital in the form of permanent equipment, such as buildings, fences, roads and ditches, makes up a relatively smaller part of total capital requirements as farms increase in size. Moreover, the land area occupied by such permanent equipment also becomes smaller relatively to the total acreage of the farm. It follows that on the larger farms a higher proportion of the capital and of the land is available for direct productive use with a consequent reduction in overhead costs per unit of product produced. This should be of particular importance in agriculture which, as already stated, is an industry where the fixed overhead charges tend to form a disproportionately high part of total production costs.

The large farmer is also better placed to make more efficient use of machinery under his own control. Thus on the large farm there is a better chance of power and other machinery being used to its maximum capacity, while the larger fields greatly facilitate the ease and economy of manipulation. Moreover, machines can be placed in expert hands and can be better serviced on farms which are large enough to have workshops of their own and stock their own supplies of spare parts.

In the financial sphere the large farmer also possesses the advantage of a bigger turnover which gives him a greater total profit even when his margin of profit per acre is low. For example, a farmer with 500 acres will have a sizeable income if he has a profit margin of only £1 an acre, but a small farmer with 50 acres would have to make a profit of £10 per acre to make the same total income. In other words the profit-making opportunities are more flexible on the large farm, and, in particular, the large farmer can adopt systems of farming which return only a small profit per acre.

Lastly, and perhaps the most important advantage of all, is the opportunity which exists on the large farm of benefiting from the efficiencies of division of labour and the use of expert skill. Division of labour is only possible where a team of workers is engaged. Moreover, no fixed hours of work or regular leisure and holidays are possible except when several workers share the task of the farm. Of even greater significance is the division of function between managerial and manual workers. This is possible only on the larger farms, for on small farms where one or two men constitute the whole labour force there is no time, even though there may be aptitude and ability, for the exercise of any really effective managerial function.

Although large-scale farming possesses all the above potential advantages it would appear, nevertheless, that in practice these advantages have not compared in extent with those which have resulted in the preponderance of large-scale producing units in other industries. There are many reasons for this significant difference.

Some of the technical reasons have already been discussed in Chapter V when the limitations to the division of labour in agriculture were discussed. Thus the preoccupation of farming with living things, the dependence on season and weather, the dispersal of relatively very small labour forces over large surface areas and the absence of continuous routine activities present a set of conditions totally differing from those in a factory.

Secondly, the very different influences exercised by the machine in farm and in factory were also discussed in Chapter V. In agriculture there are only limited possibilities in the use of power equipment especially as farms and fields are so often remote from power sources, though the advent of the mobile internal combustion engine has increased the possibilities in this respect. Again, the limiting influence of the seasons and the time-factor on the use of many expensive machines, such as the combine-harvester, is especially important. Diversified farming, and especially livestock production, reduce still further the scope for the use of specialized equipment on any one farm. In this connection it may be pointed out that fields which are an economic size for mechanized crop production are not necessarily ideal for livestock, especially dairy cows. Then, since the products of farming do not consist of different parts which are brought together by inorganic means, there is no process on the farm which can be compared with those associated with the assembly belt of the modern mass-producing factory.

Thirdly, the early approach of conditions of diminishing returns in farming means that expanding the scale of operations generally entails resort to *extensive* methods as contrasted with the *intensive* methods of large-scale production under factory conditions. In practice this means that enlarging the scale of operations in farming generally takes the form of increasing the role of land rather than the role of capital. Increasing the scale of farming is handicapped, therefore, by the difficulties of securing land in large contiguous blocks. Indeed, conditions of land-ownership and occupation in this country are such that it is rarely possible for a farmer to expand gradually by taking on a few extra acres at a time. If he wishes to farm on a larger scale it is usually necessary for him to move to a larger farm or to take on a second farm and run it in conjunction with the parent holding. Very often, however, the latter process of farming a group of scattered units may deprive him of many of the practical economies of increasing the scale of his operations.

Fourthly, the biological nature of farming processes would appear, in practice, to have a limiting effect on the establishment of a separate salaried class of managers in agriculture. In particular there are technical difficulties and dangers in the exercise of remote control of plants and animals by a management located far away from farms. The many unpredictable but vital decisions which the farmer has to take almost daily and even hourly put a premium on the personal aspect of management which is incompatible with a high degree of centralization. But instituting an adequately decentralized staff of managers and sub-managers to ensure that all important decisions are taken at crucial moments would create a new set of overheads which might be extremely high in relation to any probable increase in output or turnover. This situation has no exact parallel in most other industries where the delegation of executive decisions to a salaried managerial class has long been accepted as a *sine qua non* of efficient organization.

Finally, the universal supremacy of the family business in farming with the consequent absence of corporate enterprise of the joint-stock type does not make for continuity of policy. Thus when a farmer relinquishes control of the farm his successor does not necessarily take over the farm as a producing unit with the same equipment of capital in the form of machinery and livestock. (This is often so even when son follows father ; it is almost always so in all other cases.) This lack of continuity is not conducive to the development of large-scale organization in any industry. But in farming it is still more serious, for farming is a business which needs to be run on a long-term programme. Thus the rotation of crops must be planned in advance for several seasons, while the livestock departments take years to build up and align with the general dimensions of the whole farm unit. It is noteworthy that few of the well-known large-scale farming organizations in this country have survived their founders. Indeed most of the large-scale farming enterprises " have had so short a life, and they have been so few in number, that we have not been able to learn much from them as to the economies in management which may be effected under such a system." [1]

SMALL-SCALE FARMING

While it would not be easy to produce convincing evidence that the advantages of large-scale farming are more potential than actual, the fact remains that large farms are still the exception rather than the rule in agriculture. It is necessary, therefore, to examine the reasons for the tenacity with which the small entrepreneur has maintained a numerically predominant position in the agricultural structure not only in this country but the world over. In doing so it is not enough to consider technical and economic factors only, for non-economic considerations are of equal, if not of greater, significance to an understanding of the position.

Both in factories and on farms the technical advantages of the large unit of production are more pronounced where the work can be done with expensive machines and with large staffs of workers. On the other hand, where the emphasis is on intimate care and personal attention to detail the advantages are with the small producing unit. Broadly speaking, the latter qualities characterize most operations in farming, concerned as they are with growing crops and with living animals. This places the small family farm employing little or no hired labour in a favourable position. Not only does the financial interest of the family workers ensure the qualitative intensity of their work, but the more intimate relationships existing on small farms also ease the supervision of any hired workers that may be employed. Moreover, family labour is much more flexible to cope with the irregularity of much farm work arising from the variable conditions of seasons and weather and the unpredictable needs of crops and of livestock. Because of this, reliance on family workers may make it possible for the small farm to gain more than it loses from the absence of the potential benefits of division of labour and the use of machinery.

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[1] J. F. Duncan, "Personal Factors in British Agriculture," *J. of A.E.S.*, vol. vi. No. 1, 1940, p. 28

In farming the rates of physical output are measured in terms of the crop yields per acre, or milk yield per cow, or egg yield per hen and so on. There is no technical reason why these rates of output should have any relation to the sizes of farms as such. Thus crop yields depend not on the *acreage* of crops grown, but on the quality of the land, variety of seed and the degree of manuring and cultivation. Likewise rates of livestock output are determined by the breed, quality, feeding and management of the animals and not by the *numbers* of animals kept. Nevertheless, inasmuch as both crops and animals respond to individual care and attention, the small farmer has the advantage in that his sphere of supervision is not beyond his personal capacity. Moreover, since small-scale farming is more intensive while large-scale farming tends to be more extensive, higher gross production per acre is generally obtained from the smaller farms. In this connection, however, it is necessary to stress the difference between gross and net outputs, for it is the latter which really tests the efficiency of production. It is also relevant to point out that small farms have high gross outputs per acre not because they are small farms, but because they have to be intensively cultivated. Intensively cultivated large farms can, and do, attain comparable results.

It cannot be denied that small farms, worked as independent business units, have serious commercial disadvantages with which to contend. They are rarely able to offer regular supplies of their products for sale, nor are they able to buy their requisites in sufficiently large quantities to take advantage of the cheapest terms. But it is claimed that these commercial drawbacks can be largely overcome by joint action on the part of small farmers themselves. Thus co-operative organizations can go far towards ensuring for the small farmer many of the benefits of bulk purchase and bulk sale, as well as many other trading privileges enjoyed by the large farmer in virtue of the greater size of his business transactions. Moreover, the small farmer is not, in practice, so seriously handicapped as might be expected in the prices he obtains for many of his products even when he acts in isolation. This is obviously so in so far as the prices of some of his major products (milk is an important example) are fixed and non-competitive. But it is also true of certain other products with competitive prices, e.g. livestock which are generally sold on the basis of individual animals or in small lots, and the more highly perishable fruit and vegetables, the prices of which depend more on rapid transit to good markets than on the bulk in which they are sold.

The protagonists of the small farm, however, do not base their case only, or even primarily, on these technical and economic considerations. On the contrary, they maintain that large-scale farming inevitably tends to bring about a socially undesirable pattern of rural life, while the small-scale farming system has important social and political merits. It is essential that the economist should also take cognizance of these considerations though he is only indirectly concerned with their validity. Two groups of considerations, in particular, must be mentioned here.

In the first place small holdings and small farms form the first rungs of the so-called agricultural or rural social ladder.

They provide a means for the experienced farm workers to start on their own and rise into the ranks of farmers. Apart from its social implications, this argument is sometimes advanced as being in the interests of the efficiency of the industry as a whole. But it is doubtful if the small farm is the best school for the prospective manager of the large farm, for the conservative qualities of frugality and caution which are assets in ascending the ladder are not the best qualifications for success in the management of large-scale undertakings. Moreover, the only condition for the effective working of the ladder theory is that there are as many farmers stepping off the higher rungs as are stepping on at the bottom, for it is not possible to increase simultaneously the numbers of both small farms and large farms in an old-established country like Britain. But, since this is so, the ladder is obviously extravagant as such since it means keeping a ratio of about 6 " bottom rungs " to every 1 " ladder."

The second group of arguments rests on the fact that small holdings and small farms support a larger number of persons per acre than do large farms. In this way they help to impede the rural exodus which, according to the argument, is to be regarded as an evil rather than as a symptom of economic progress. Moreover, small holdings satisfy the "natural" ambition of the " land-hungry " who regard farming primarily as " a way of life." They also cater for those who value independence and who are not in love with working to orders. Small-scale farming is also calculated to foster certain socially desirable characteristics such as thrift, sobriety and diligence. In times of economic stress and depression the non-commercial aspects of small-scale farming, such as the small cash outgoings and the ability of the farm family to " live off the holding," give the small farms a measure of stability which is of great importance. Finally, small farms possess an important political significance inasmuch as they distribute property or its control, thereby acting as a bulwark against revolutionary changes. These are the considerations which have caused many countries to cling tenaciously to the " peasantry " as the mainstay not only of their agriculture but also of the whole national economy.

(In considering the above arguments it is of interest to note the fundamental change of emphasis which underlies recent official policy in the matter of creating legislative small holdings in this country. Thus it is made perfectly clear in the new small holdings policy adumbrated in the Agriculture Act, 1947, that in future there is to be no question of settling on the land men who have no previous agricultural experience or training, in the hope that they will make good. On the contrary, the new aim is to provide small holdings for letting to people with sufficient agricultural experience to render it likely that they will make a success of farming on their own account. Other things being equal, preference is to be given to agricultural workers and the sons of small farmers so as to provide them with the opportunity to acquire independence in agriculture. This change of emphasis means, in effect, that in future the official small holdings policy is to be determined primarily by agricultural considerations rather than, as in the past, by social considerations such as the satisfaction of land hunger or the settling of unemployed on the land.)

Whatever substance there may be in these arguments for the small farm, the impressive fact is that small farms remain the prominent feature of the agricultural structure. Indeed, small farmers are so numerous and control so much of the total agricultural resources that the efficiency and the productivity of the industry as a whole depend to a considerable extent on the standards attained by them. Moreover, the conservative forces which make for rigidity in farming are so strong that any radical change is only likely to be brought about slowly. In these circumstances economic arguments for and against large and small farms are not likely to lead very far. The important practical consideration, therefore, is to recognize not that small farms are better or worse than large farms but that they are different. From the economic angle there are two important aspects to this difference.

The first is that, although the bulk of small farmers are concerned with production for the market, there are influences other than the profit motive which still determine their actions as producers. In particular, although they may not satisfy their needs in the old " subsistence " manner, they do nevertheless work primarily to provide an income for the family. This may mean that, so long as the small farmer can obtain enough money for his domestic needs from a way of farming which is familiar and which appeals to him, he is not much concerned about increasing his profits by alternative methods of production. It is here that economic theory is badly handicapped, for it is necessary to remember these non-economic stimuli in interpreting the response of agricultural production to the price mechanism described in Chapter X.

The second aspect is concerned with the organization of special measures to overcome the various diseconomies under which small farmers operate while retaining the small-scale farming system itself. In the field of management it is not surprising if the general standard of efficiency in an industry run by some quarter of a million small entrepreneurs is not very high. This has long been recognized by the provision of a salaried class of consultants maintained not by the industry itself but out of public funds. In this country a new state service—the National Agricultural Advisory Service—is being set up to ensure that all farmers can obtain free competent advice on all matters pertaining to the technical and administrative problems of their farms. In the field of equipment the small producer needs special attention from the engineer and the implement manufacturer if he is to obtain small and cheap machines suitable for his special circumstances ; there is also need for some organization, co-operative or otherwise, to enable the small farmer to have the occasional use of the bigger machines for special purposes. Again, the small farmer's livestock policy needs to be helped by the outside supply of good sires etc., for his herds and his flocks are generally too small to enable him to pursue an adequate policy of livestock improvement on his own. Finally, in the commercial sphere special organization must be forthcoming to remedy the small farmer's deficiencies in the supply of capital and credit, in the purchase of his many requisites, and in the sale of his small outputs.

THE OPTIMUM SIZE OF FARM

In the preceding sections the size of the producing unit in agriculture has been stated in the usual conventional form of the area of land involved. But, as in other industries, the size of the producing unit in agriculture can also be measured in terms of the use made of any one of the factors of production, i.e. size can be expressed in terms of acres, men and capital. This means that the problem of the optimum size of farm is, from the strictly economic standpoint, only one aspect of the wider problem of the optimum combination of the factors of production discussed in the previous chapter. This, in turn, depends on the general theory of equilibrium and from this standpoint no one factor should be regarded as more fixed in supply than the others.

From the practical point of view, however, some guidance is given to a consideration of the optimum size of farms by the fact that the factors themselves are used in units, some of which are indivisible while others may be used in any quantities however small. The optimum size under any set of conditions must, therefore, have some relation to the ratio between the indivisible and the divisible units used. In particular, farms should be large enough to give full scope to the most expensive indivisible unit of any one factor of production used. A brief consideration of the three factors from this point of view will make clear the general principle involved.

In theory the units of land are highly divisible and in new countries a farmer can add land to his farm in almost any amount. But, as stated already, in an old established country like Britain it is far from easy to add to the area of land constituting a farm. Indeed it might well be said that the unit of land in this country is never less than a field, more often it is a whole farm. Moreover, the size of both field and farm is almost always outside the control of the farmer who wishes to add them on to his existing holding. It is equally difficult for most farmers to reduce the size of their farms, though farmers who own their farms can, of course, let out one or more fields. This tendency for the "negotiable" land unit to be identified with the farm itself is one of the principal hindrances in practice to the enlargement of the producing unit in agriculture. From the point of view of the farmer himself, it is also an important reason for regarding land as the one factor of production which in practice is fixed in supply.

With labour the unit is the human being. But there are few systems of farming in which one person alone can do all the work of the farm. Under conditions of family farming perhaps it would be more realistic to say that the unit of labour is the farmer and his family, and it is one of the inherent dangers of family farms that they do not necessarily give a perfect fit of family to farm. It is clearly necessary that the farm should be large enough to make full use of each unit of labour (i.e. each individual) regularly employed. Unless this is so the farmer and his workers, whether family or hired, cannot obtain a living from the farm. The many farms which are too small to give employment to even one man constitute the large number of part-time holdings which exist in this country.

Capital is used in a great variety of forms. Some forms such as seed or manures or feeding-stuffs are capable of minute sub-division. Other forms such as buildings or machines or cows or horses cannot be split up. Buildings, power plants and machinery generally constitute the most expensive indivisible capital units used, and it is these which need to be most carefully aligned with the general dimensions of the farm. Unless the farm is large enough to give the fullest possible scope for these more expensive units of capital investment it means that there are excessive overhead costs in respect to them. Frequently farmers can overcome this danger either by the use of the more expensive equipment on contract terms, or they themselves may hire out their own equipment to other farmers. It is here, undoubtedly, that the rigidity of the farm area is a serious hindrance to efficiency, for it means that in practice it is necessary to adjust the equipment to the farm, for rarely can the farm be adjusted to the equipment. In this connection the change-over from the horse-power economy (which obtained when the bulk of the farms of the country were laid out) to a tractor economy has rendered many farms too small and there is ample scope for amalgamation for this purpose alone.

These considerations justify some definiteness about the lower limit of size, for a farm must be large enough to give full employment to each whole-time worker employed on it, and it must be large enough to make the maximum use of the most expensive single unit of capital equipment. If the farm is not large enough to ensure this, and if there is no outside work for men or equipment, then both labour and capital are clearly being inefficiently used and there is waste of economic resources.

It is not so easy to be dogmatic about the upper limit of size, for this depends ultimately on management—the most variable of all the factors in the situation It is here that the *method* of business organization needs to be considered. Under the family organization the managerial capacity depends on the individual farmer. Since there are farmers of every degree of business and technical ability it is probable that the great variety of farm sizes now obtaining, and especially the preponderance of small and medium-sized farms, is a fairly true reflection of the range of managerial capacity now available to the industry. On the other hand, it is also possible that some form of corporate or co-operative organization would ensure a better utilization of available managerial resources. But the adoption of such an organization of itself would not necessarily result in the universal development of large-scale producing units. On the contrary, the great difference of natural conditions, together with the great variety of enterprises which make up farming, might justify the big-scale business organization continuing to run its farms in units of various sizes in which small-scale farming would still feature.

It is not possible, however, to discuss the question of the size of farms, or more strictly the question of the adjustment of the size of farms, without taking into account the overriding problem of the ownership of farm land.

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CHAPTER VIII

LAND TENURE

The term " land tenure " is used in a wide sense to cover the economic, legal, political and social customs concerned with the ownership of land. Land tenure is not only or even mainly an agricultural problem, for it concerns urban and non-farming as well as rural and farming interests. Even as an agricultural problem, land tenure belongs more to the field of land economics rather than farm economics for it is concerned more with land administration than with farm administration. Nevertheless, the system of land tenure has an obviously direct bearing on the economics of agriculture, especially since, in the present stage of development, the land itself is in a very real sense the most important raw material of the industry. It is with the economic implications of land tenure that we are concerned, though it is not possible to discuss these in isolation for they are inevitably subject to the political, social and legal environment in which they operate.

From the agricultural standpoint, systems of land tenure fall into one of two broad categories, viz. occupying ownership and tenancy. A brief statement of the characteristics of each of these two categories will form a useful introduction to a discussion of the present position of land tenure in British agriculture.

Occupying Ownership

Occupying ownership is the term generally used to refer to the system of land-holding where the farmer, or the occupier, is himself the sole nominal owner of the land he farms. This form of land tenure is the dominant system over a large part of the world, and there are many countries where it is accepted without question as the ideal system of holding land by farmers.

This unquestioned acceptance of occupying ownership springs from the belief in the political and social virtues of private property. Indeed, no discussion of the merits of the system seems complete without the citation of Arthur Young's famous aphorism " that the magic of property turns sand into gold." It is not the business of the economist to stand advocate for or against any such contention, but it is necessary for him to examine the economic implications of an agricultural structure based on the ownership of the farm by the farmer himself.

The economic arguments in its favour can be stated very briefly. It is simple and straightforward with the function of owner and farmer merged and the whole farm—property and business—under one control. The personal interest of the owner-farmer both in the farm property and in the farm business is calculated to ensure that the system of farming will not be to the detriment of the property, while property rights alone will not be allowed to hinder the adoption of optimum farming methods. On the contrary, inasmuch as improved farming is likely to benefit the farm property, while property improvements will facilitate improved farming, the owner-farmer has every incentive to improve both, since the full benefits will accrue to him exclusively. In other words, the owner-farmer has, nominally at least, complete economic freedom as well as every financial inducement to develop both his farm and his farming according to his own judgment. Finally, the legal status of owner ensures absolute security of tenure, so that the farmer can invest freely in his farming without fear of not being allowed to remain long enough on the farm to reap the full benefits of his investments.

In practice, however, the system of occupying ownership gives rise to at least three serious economic problems which go far to offset its more obvious advantages

The first of these follows from the fact that occupying ownership represents the extreme type of the family business in the agricultural industry, and therefore it also represents the type wherein the least division of function is practised. In the first place, the absence of any separation of ownership from farming means that the owner-farmer has to provide both the landlord's capital and the tenant's capital. This often results in forcing the owner-farmer as an owner to withdraw capital from farming for the purpose of land investment, even though as a farmer he badly needs such capital for investing in the working equipment of the farm. It also means that the owner-farmer has to master the technique of land administration as well as the technique of farm administration. These two techniques require very different aptitudes. Moreover, land administration in any effective sense is hardly possible so long as it is circumscribed within the bounds of a single farm.

Secondly, the owner-farmer is apt to forget the important difference which exists between landlord's capital and tenant's capital. The absence of any formal rent payment coupled with the far too general absence of intelligent financial accounting may lull him into forgetting the need to make provision for interest on property investment and cost of upkeep in assessing his farming income. A more serious danger is the failure to appreciate the essential difference between long-term and short-term credit and thereby incurring a form of indebtedness which is thoroughly undesirable. Thus the owner-farmer is liable to mortgage his property for other purposes than for property development, since the comparative ease with which money can be raised on real property tempts him to use his title deeds as collateral security for purely *farming* purposes. It has been well said that " if there is anything certain in agriculture, it is that the land should never be pledged for working capital."[1]

Finally, the merging of property interests and farming interests in the same person accentuates the difficulties resulting from the lack of continuity of financial resources following on inheritance. The laws and customs with regard to the succession to property are all-important in this connection. In some countries the farm unit is itself parcelled out among the various heirs, and the resulting fragmentation leads to the multiplicity of pigmy holdings of a totally uneconomic size. But even where the farm passes as an undivided unit to one of the heirs, it is generally necessary to create a charge on the property to provide for the other members of the family. This is a frequent cause of mortgage indebtedness and, together with the other causes for financial stringency, may well mean that the owner-farmer is owner only in name. Very often the effective owner is the mortgagor or the money-lender, and this gives point to the trite farming saying that " there is no worse landlord than borrowed money."

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[1] H. M. Conacher, " The Relations of Land Tenure and Agriculture,' *J. of A.E.S.*, vol. iv, No. 3, 1936, p. 176

The chronic encumbrance of mortgage debts is a familiar feature of farming in those countries where the system of *peasant proprietorship* prevails. These are the countries in which the social structure is dominated by the ideal of small farm properties owned and worked by the farm family. Peasant proprietorship characterizes most of the countries of north Europe, and programmes of " agrarian reform " in many other European countries are inspired with the aim of extending and perpetuating the system.

But it would be wrong to assume that occupying ownership is a function of the small-farm system, or vice versa, for it is also found in countries where farms are large. Thus it is the characteristic form of tenure in the more recently developed countries of South and North America, Australia, New Zealand and South Africa. In Great Britain, also, there is no marked relationship between size of farm and the form of land tenure; in fact there is some tendency for both the very small holdings and the very large farms to show a higher proportion of owner-occupiers than obtains for the medium-sized groups.

TENANCY

Systems of tenancy differ from occupying ownership in that there is both a legal and an economic separation of land-ownership from land use. Tenancy systems depend on a legal contract by which the owner of the farm property (the landlord) lets it on hire for use by another person (the tenant) who farms it. Under the contract the landlord obtains payment for the use of the farm in the form of rent (not to be confused with economic rent as described in Chapter III). The duties of the landlord are to supply the permanent capital in the form of land, farmhouse, farm buildings and all necessary fixed equipment ; the duties of the tenant are to supply the working capital, the labour and the managerial resources necessary for the running of the farm.

There are many forms of tenancy systems, but from the economic standpoint they can be grouped on the basis of (*a*) the form of rent payment, (*b*) the degree of control exercised by the landlord, (*c*) the length of the tenancy agreement, and (*d*) the economic status of the landlord.

(*a*) The rent can be paid in money, in services, or in kind. All three forms have existed in this country in the past, but today money rents are almost universal. The payment of rent, in the form of services, or " labour-tenancy " as it is sometimes called, was an important feature of feudal times, but it is now discredited in most advanced countries, though it is still practised and encouraged in some colonial territories. Rents in kind, on the other hand, are still an important feature of many tenancy systems abroad, two important examples being the *métayage* system on the continent of Europe and the various share-tenancy systems in the United States of America. In all these systems part at least of the rent is paid either as a fixed quantity or as an agreed proportion of the produce of the farm.

(*b*) Under some forms of tenancy, especially *métayage* and share-tenancy, the landlord has a considerable say in the character and extent of the farming system. Under other systems, and especially in this country, legislation has gone far to invest the tenant-farmer with almost complete freedom to choose and to practise any system of farming he wishes. In this connection it should be stated that, where the landlord exercises control and rents are paid in kind, the landlord is also often responsible for supplying much of the working as well as the permanent capital. Indeed in extreme cases, such as the bushel-renting system in the United States of America, the tenant may supply so little of the working capital, and have so small a say in the management of the farm that he is in effect merely a labourer working under the landlord's direction.

(*c*) Tenancy systems vary a great deal in the length of the lease. At one extreme in this country in former times there were leases for life or for lives. More usually, however, leases were for a fixed term of years, the more common being for seven, fourteen or twenty-one years. Leases of this length are still common in Scotland. In England and Wales, however, long leases fell into disfavour towards the end of last century, and at the present time yearly tenancies are almost universal. It is important to remember, however, that agreements from year to year may, and do, run for long periods and it is quite common for tenants to remain on their farms for life under leases of twelve months duration.

(*d*) Lastly, tenancy systems can be grouped according to the status of the landlord into private ownership, or state or public ownership. Private ownership, again, can be further sub-divided into those controlled by individual owners and those controlled by some form of corporate organization.

The chief economic advantages of tenancy as a form of land tenure in agriculture follow from the degree of specialization of function which it involves. Thus the function of owning and administering the land with its fixed capital is invested in the landlord, while the function of owning the working capital and farming the land devolves on the tenant. It is useful to distinguish these two functions as *land management* and *farm management* respectively. In this way the tenant-farmer is relieved of the supervision of the details of property upkeep and development so that he is free to concentrate his whole attention and resources on the job of farming. But the full benefits of specialization are only obtained when the unit of land owned is large enough to give full scope to the landlord also to exercise effectively his special function of land management. In practice this means that it is necessary for him to administer a large estate consisting of many farms This has been the characteristic feature of the landlord and tenant system as it has been developed in this country.

The advantages of this specialization of function are reflected also in important ways in the financial sphere In the first place the landlord and tenant system widens the supply of capital and credit for agriculture. Indeed it goes some way towards fulfilling one of the important objectives of the joint-stock structure, since it often brings together those in possession of capital who cannot or who do not wish to farm and those who have limited capital but can command labour power and farming skill. The most ardent advocates of occupying ownership admit that tenancy gives an opening to competent farmers who could not afford to buy their farms. Furthermore, a system of tenancy possesses greater financial elasticity, thus in bad times rents may be lowered, whereas interest on borrowed money hardly ever moves in sympathy with a fall in prices. In this way the landlord often acts as a buffer to the farmer by taking part of the shock of the financial storm either through some abatement or postponement of the rent charge.

Finally, the landlord and tenant system is capable of having important influences on the technical development of farming especially where the landlord is able and willing to assume the role of farming leadership For example, under the *métayage* system in Europe where the farms are small and the tenant's technical ability only moderate, the landlord is often in a position to guide and, if necessary, to enforce on his tenants improved farming practices. But even in more progressive communities tenant farmers can also be stimulated and given opportunities by a progressive landlord. This was notably so in some parts of this country in former times, and many old leases still extant bear witness to the far-seeing farming statesmanship of the landlords in the steps they took to ensure that good farming practices were followed by their tenants.

These advantages of tenant farming are only realized in practice, however, when adequate safeguards exist against certain dangers inherent in the tenancy system of holding agricultural land. Most of these dangers arise because there is always the possibility that the landlords (the owners of the property rights) may misuse their legal powers to the detriment of their farming tenants. Indeed the history of the land question in this country supplies some notorious examples of agricultural landlords who have used without scruple their legal and economic powers to interfere even with the religious and political freedom of their farm tenants. More generally, however, criticisms of tenancy systems have centred on the absence of the " three F's," i.e. the absence of fair rents, fixity of tenure and free sale. To these can be added the absence of freedom of cropping and compensation for improvements and disturbance. These potential defects of tenancy systems have resulted in the two-fold indictment : (*a*) that from the economic standpoint tenancy systems either fail to induce the full use of land or tend to its exploitation, and (*b*) that from the political and social standpoint tenancy systems tend to instability since they unjustly restrict both the economic and the personal liberty of tenant-farmers.

THE AGRICULTURAL HOLDINGS ACTS

It is the achievement of the tenancy system as it functions in this country that it has gone far to disprove this general indictment. This has been brought about by the creative legislation of the Agricultural Holdings Acts, which to a large extent incorporate and extend the best " customs of the country," as these were developed and practised on the more efficient and progressive private estates. The first Agricultural Holdings Act was passed in 1875, and the last Consolidating Act in 1923, but the provisions have been recently reinforced and developed under Parts II and III of the Agriculture Act, 1947. This body of legislation has given to the tenant farmer, (*a*) safeguards against rack renting, (*b*) freedom of management, (*c*) compensation for unexhausted improvements at the end of the tenancy, and (*d*) reasonable security of tenure and compensation for disturbance. It is necessary to indicate very briefly how this is done, since it means that tenant-farmers in this country virtually enjoy most of the farming advantages of ownership without having to shoulder the economic and financial responsibilities which ownership entails.

(*a*) *Fair Rents.* It has often been asserted that under the landlord and tenant system the value of all benefits in farming finds its way ultimately into the pockets of the landlord in the form of higher rents. Thus even a tenant who improved the farm by his good farming might be penalised by having his rent increased. Although rents are still fixed by competition in this country, the tenant's bargaining position is now strengthened by the legal provision which enables the submission of rent to arbitration.

Prior to the 1947 Act any tenant farmer, renting on a yearly basis, who considered that he was paying too high a rent for his farm could request an arbitration for the purpose of rent adjustment in each second year of the tenancy. The landlord could likewise request arbitration for the purpose of rent adjustment where he considered that an increase in the rent by a sitting tenant was justified. If one party refused to agree to arbitration procedure, the other party could terminate the tenancy. The effective safeguard for the tenant, however, was the provision whereby he could claim compensation for disturbance if he left the farm because his landlord had refused arbitration on rent.

The 1947 Act introduced new provisions for the adjustment of the rents of holdings. Now the landlord or the tenant can demand a reference to arbitration, and the demand, if properly made, cannot be refused. This is subject, however, to the provision that the rent once fixed by arbitration must run for a period of at least three years. The purpose is to ensure that rents can be adjusted at reasonable intervals in accordance with the economic circumstances of the industry. Furthermore, the landlord is given a new statutory right to obtain an increased rent from his tenant where he has carried out an improvement which has increased the value of the holding This new provision is designed to encourage the modernization and improvement of the fixed equipment of the land.

(*b*) *Freedom of Farming*. The tenant-farmer is given almost complete freedom to manage his farm according to his own judgment and the imposition of " restrictive covenants " by the landlord are rendered null and void. Thus the tenant has the right to crop his arable land and to dispose of the produce (other than manure) of the holding in such manner as he pleases, except in the last year of his tenancy when he is bound by the terms of his tenancy agreement. This freedom does not, of course, mean licence to mismanage the land and damage the farm, for the landlord can claim an injunction against a tenant who is " violating the rules of good husbandry." The landlord can also claim compensation against the tenant for dilapidations to buildings etc. as well as for injury to the land itself by bad farming.

(*c*) *Compensation for Improvements*. The payment of compensation for the value of unexhausted improvements, and especially for those carried out during the last year of the tenancy, was always the practice of good landlords. The first Agricultural Holdings Act of 1875 made legal provision for it, and subsequent Acts, including the 1947 Act, have extended and codified the practice. Statutory compensation is now provided for four classes of improvements as follows : (*a*) Long-term improvements of such substance as might alter the character of the holding, e.g. erection of buildings, provision of water, electric supply, etc. For these the landlord's previous consent must be obtained if compensation is to be claimed, the measure of the compensation being the increased value of the holding attributable to the improvement. (*b*) Medium-term improvements, such as the liming of land, which do not require any consent, and for which the basis of compensation is the value of the improvement to an incoming tenant. (*c*) Tenant right matters for which, prior to 1947, the basis for compensation was either the *custom of the country* or the terms of the contract of tenancy. The 1947 Act makes provision for the codifying of tenant right valuations in the interests of certainty and uniformity, and lays down that tenant right compensation must be based on the value to an incoming tenant by virtue of the Act. (*d*) Finally, under the 1947 Act a tenant on quitting his holding can claim compensation for having increased the general value of the holding by the continuous adoption of a special system of farming more beneficial than the system of farming laid down in the contract of tenancy, or than the system normally practised on comparable agricultural holdings.

All matters of compensation are assessed and applied by professional valuers and may be submitted to arbitration. (In this connection it is of interest to refer to the so-called " Evesham Custom " which obtains in the well-known horticultural area of Worcestershire. By the established local custom the out-going tenant finds a successor who is prepared to pay him the compensation he demands. The landlord can either accept the new tenant, or else he must pay the " outgoing " himself. This method is just as between landlord and tenant and works well where there is keen competition for farms.)

(*d*) *Security of Tenure.* Having regard to the long-term nature of farming, insecurity of tenure is the most serious of all the potential drawbacks of tenancy systems. In many ways, therefore, the legal provision of safeguards against unreasonable eviction is one of the most important features of the law of landlord and tenant. These provisions are indirect for the tenant-farmer is not given any legal security beyond the terms of his agreement. Nevertheless, the provisions are calculated to put a premium on continuity of tenure for they penalize the landlord who evicts a tenant-farmer for any reason except bad farming. Thus a high measure of security is given to the tenant by restrictions on the landlord's right to terminate the lease, as well as by provisions for compensation for " unreasonable disturbance."

Even in cases of tenancies from year to year a landlord must give his tenant prior notice in writing of his intention to terminate the agreement. Moreover, such notice to quit cannot terminate the tenancy earlier than twelve months from the end of the current tenancy year. In effect this means that every tenant-farmer can safely assume that he can stay in his farm for at least two farming seasons. A notice to quit is also necessary to terminate leases of two years or upwards, and if no such notice is given the tenancy will automatically continue on a yearly basis. Under the 1947 Act a tenant farmer may, within a month of receiving a notice to quit from his landlord, serve a counter-notice objecting to the notice. If he does, the notice to quit will not be valid unless the landlord obtains the Minister's consent. Such consent may only be given if (*a*) it is in the interest of farming efficiency, (*b*) the land is wanted for agricultural research or education, small holdings or allotments, (*c*) the landlord, having specified in a written contract of tenancy that he will want the land for some purpose for which he holds the land, serves notice for that purpose and greater hardship would be caused to the landlord than the tenant by withholding consent, (*d*) the tenancy was created before the Act was passed and greater hardship would be caused to the landlord than the tenant by withholding consent, or (*e*) the land is wanted for some approved non-agricultural purpose such as forestry. In all cases of proposals to grant or refuse consent to a notice to quit, the parties concerned can make representations, and may appeal to the Agricultural Land Tribunal set up under the Act.

Of equal importance are the provisions for compensating the tenant-farmer for " unreasonable disturbance." Where a tenant is required to quit a holding through no fault of his own he can claim compensation for disturbance. The amount of such compensation in general shall not exceed a year's rent, but if the loss and expense to the tenant is proved to be greater the compensation can equal the sum proved up to a maximum equal to two years' rent of the holding. This is a powerful deterrent to the arbitrary or frivolous eviction of competent and solvent tenant-farmers for reasons totally unconnected with the agricultural use of their farms.

Compensation for disturbance is in addition to any outgoing compensation to which a tenant may be entitled in respect of the value of unexhausted improvements. It is not paid, of course, where the tenant and not the landlord is at fault. Thus no compensation is payable where notice to quit has been served because of bad farming, violations of contract, arrears of rent or where the tenant becomes bankrupt. On the contrary, where the tenant has failed to farm "according to the rules of good husbandry," the landlord can apply to the appropriate authority for a certificate of bad husbandry against the tenant. The granting of such a certificate frees the landlord from any liability for compensation for disturbance and from the need to obtain the Minister's consent to a notice to quit.

In its influence on land tenure, however, the real significance of the Agriculture Act, 1947, arises from the fact that it gives legislative expression to the concept that both the ownership and the occupation of agricultural land is a public trust. This expression is given in Part II of the Act which is aptly entitled *Good Estate Management and Good Husbandry.* Part II is concerned with the legal safeguards necessary to ensure that, on the one hand, the owners of land shall carry out their duties according to *the rules of good estate management,* and, on the other hand, the occupiers of land shall carry out their duties according to *the rules of good husbandry.*

This is the first time that the rules of good estate management have been given statutory force. In fact, however, no formal set of rules are given in the Act. It is merely stated that the owner shall be regarded as doing his duty if "having regard to the character and situation of the land and other relevant circumstances" his management of the land enables "an occupier of the land reasonably skilled in husbandry to maintain efficient production as respects both the kind of produce and the quality and quantity thereof." In this connection regard is to be given to the way in which the owner "is providing, improving, maintaining and repairing" the necessary fixed equipment such as farm buildings, drains, ditches, hedges, etc. Broadly speaking, therefore, the job of the owner is to manage his land reasonably adequately, and in particular to provide, maintain and repair the fixed equipment necessary for that purpose.

The rules of good husbandry apply equally to the owner-occupier and to the tenant-farmer. They, also, are defined in general terms. The essence of the definition is that the occupier of the land must maintain a "reasonable standard of efficient production, as respects both the kind of produce and the quality and quantity thereof." Moreover, good husbandry involves not only a satisfactory standard of current production, but also keeping the holding in such a condition as to enable that standard to be maintained in future years. In determining compliance with the rules[1] regard is to be given to the character and situation of the holding and to "other relevant circumstances," so that there will be no question of the farmer being penalized for some apparent neglect of the rules due to causes outside his control. Broadly speaking, therefore, the job of the farmer or occupier is to maintain a reasonable standard of production, both as regards his system of farming and the way he carries it out, and to preserve the fertility of the land. If he is a tenant, he is also responsible for the maintenance and repair of fixed equipment, if such responsibility is placed on his shoulders by written agreement or otherwise.

(A Regulation under the 1947 Act[2] gives a model clause setting out the responsibilities of landlord and tenant in relation to the maintenance, repair and insurance of fixed equipment. This clause applies to all cases where there is only a verbal tenancy agreement. There are also provisions whereby written agreements differing widely from the model clause can be brought into line. Where by agreement or otherwise a particular duty is on the landlord, the tenant is not penalized under the rules for non-compliance, and vice versa. In this connection it should also be noted that the Act makes provisions for either the landlord or the tenant to have his whole relationship with the other party clearly defined by a written tenancy agreement. If necessary this can be settled by arbitration, and the arbitrator may, if he thinks it fair, adjust the rent as a result of any changes which may have been brought about in the relative liabilities of the parties. This general provision means that it is now possible to alter existing contracts of tenancy at the instance of one of the parties or of the State in the light of changing circumstances.)

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[1] In addition to the general definition of good husbandry the farmer is required (*a*) to keep permanent pasture properly mown or grazed and maintained in good fertility and condition; (*b*) to crop arable land so as to keep it clean, fertile and in good condition; (*c*) to keep the holding properly stocked, if the farming system involves the keeping of livestock; and to maintain efficient standards of management and breeding of livestock where stock are respectively kept or bred; (*d*) to keep crops and livestock free from disease and from pest infestation; (*e*) to protect and preserve harvested or lifted crops; and (*f*) to undertake necessary work of maintenance and repair.

[2] *Statutory Instruments 1948*, No. 184

Where an owner or an occupier fails to carry out his responsibilities under the rules of good estate management or good husbandry he can be placed under supervision, he can have directions to perform certain duties served on him and, in the final resort, he can be dispossessed of his property or of his farm. These are drastic sanctions and their administration is entrusted to a number of new public bodies set up under the Act of which the more important are : (*a*) *the Agricultural Land Commission*, whose chief function is to manage farm land which comes under the Minister's control, and to advise and assist the Minister on problems of land and agricultural management ; (*b*) *the County Agricultural Executive Committees*, which take the place of the former War Agricultural Executive Committees, and act as the Minister's agents in the counties in respect to supervision, direction and dispossession, and give decisions for the Minister on questions of good or bad estate management and on good or bad farming ; and (*c*) *the Agricultural Land Tribunals*, which act as the courts of appeal from the decisions of the Minister or of the county committees where appeals are allowed.

We are not concerned here with the details of the administration of the above sanctions for dealing with landlords and farmers who will not, or cannot, fulfil their obligations to manage and farm the land properly. But we are concerned with the economic implications inherent in the very existence of the sanctions concerned. Two of these implications are of special significance to the economist. The first is that both the ownership and the occupation of farming land now carries the legal responsibility to manage it in a way which puts national interests before personal interests. The second is that the State is now an active partner in the task of maintaining and promoting both efficient estate management and efficient farm management.

Recent Trends

The landlord-and-tenant system has dominated British agriculture since the disappearance of the small freeholders—the yeomen and the lesser squires—some two centuries ago. During this time the British farmer has come to regard tenancy as a normal commercial relationship which "does not carry any social stigma." Indeed the majority of the successful farmers farming for a livelihood are firmly attached to the system and show little, if any, urge to become owners of their farms. The abundant protection given to tenant farmers by the legislation of the Agricultural Holdings Acts has strengthened and, in many ways, justified this attitude. Nevertheless, since the First World War there has been, paradoxically enough, a remarkable increase in the number of occupying owners in this country.

The extent of this change in the secular trend is shown clearly in the official agricultural statistics, defective though these are so far as land tenure data are concerned. In 1914 only about 10 per cent of the farmers of England and Wales owned their farms, in 1921 the percentage was over 20, and in 1927 it was 37 per cent.[1] In other words, within half a generation, over a quarter of the farmers of England and Wales purchased their farms and changed their legal status from that of tenants to that of occupying owners. It is unfortunate that comparable statistics were not collected after 1927, but there is some reason to believe that the rate of change was checked during the nineteen-thirties.

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[1] About 28 per cent for Scotland

Some corrobation for this view is provided by the figures given for England and Wales in the *National Farm Survey* of 1941, though it must be remembered that the figures in this report exclude holdings of less than five acres in size. According to this report 62·1 per cent of the occupiers rented 75 per cent or more of their holdings, 31·4 per cent owned 75 per cent or more of their holdings, and 6·5 per cent both owned and rented between 25 and 75 per cent of their holdings. By distributing the small number of holdings where the occupier is both tenant and owner equally between the two major categories it was possible to obtain an index of tenancy, which gave the best available indication of the proportion of occupiers in the country who were tenants and owners respectively, and the proportion of crops and grass in each category. The result of doing this for the 1941 figures was as follows : 65 per cent of the occupiers were tenants occupying 67 per cent of the total area of crops and grass, and 35 per cent were owner-occupiers with 33 per cent of the total area of crops and grass. The highest proportion of tenant-farmers was found in the northern, north-western and west-midland counties, all of which had an index of between 70 and 80. On the other hand, in the south-east corner of England the areas occupied by tenants and owners were about equal, with the rest of the country generally showing a position intermediate between these two regions.[1]

In examining the causes for the very important development which has occurred during the present century, it is undoubtedly correct to say that the impetus for change has come from landlords anxious to sell rather than from tenants eager to buy. In other words, sitting tenants with no active

[1] *National Farm Survey of England and Wales*, pp. 18–23

desire to change their status have done so rather than run the risk of having their farms bought over their heads by unknown and possibly speculative purchasers.

There is no information at all on the important question of how these new owner-occupiers have financed the purchase of their farms. It is probable that many who bought during the burst of sales between 1915 and 1921 did so, partly at least, from their war-time farming profits. But many also, undoubtedly, borrowed money for the purpose in the belief that the high price-levels then ruling would continue. The long-term credit provisions of the Agricultural Credits Act of 1923 were specifically designed for the purpose of assisting those farmers who had purchased their farms during the life of the 1917 Corn Production Act, i.e. during the years when there was a government-guaranteed price for some of the major farm products. Many of these more or less forced purchases were again on the market in the late nineteen-twenties.

But the real cause of the active market in farms since 1915 has been the decision of many big landlords to sell their agricultural estates. There are several factors responsible for this decision, and it is these factors which supply the real explanation for the disintegration of the landlord-and-tenant system which is still in progress. The more important of these factors must be briefly indicated.

As already stated in discussing the capitalization of the industry in Chapter IV, the agricultural landlords in the past were content with a moderate or even a low rate of interest on the capital invested in their agricultural estates. The landlords were content to accept this low rate of interest because they regarded land as a safe permanent investment which was reasonably free from risk in the long run. But they also accepted the low returns because they regarded the ownership of large estates as a way of life as much as a source of income. In other words the social prestige of the country gentleman, coupled with the amenity value and the sporting rights of his estates, were regarded as adequate recompense for any financial sacrifice involved through not investing the capital concerned in more lucrative ways. To a considerable extent this altruistic attitude was only possible because the landlords had adequate financial means derived from the possession of non-agricultural assets, and there was in fact an important flow of capital into landowning from trade and urban industry. Again, the tradition of landownership was a tradition of leadership in agricultural affairs, and for this a fair measure of freedom in dealing with tenant-farmers was necessary. Both of these non-financial motives have been seriously undermined. Thus, the social prestige of landowning has been greatly reduced with the advance of democratic thought, while the whole trend of agricultural legislation has been " to restrict the scope of the landlord as a director of farming enterprise, and to reduce him, step by step, more nearly to the state of a mere receiver of rent." [1]

The attractiveness of the large private estate has been further impaired by its family structure, the feature of which is the complete fusion of family and of business fortunes. Thus the continuity of the family estate has been seriously challenged by the incidence of taxation and inheritance duties. In this connection much is heard of the influence of death duties which, falling at incalculable intervals, " impoverishes periodically the estate and all that dwell thereon, and is directly destructive of that stability on which healthy country life depends." [2] The position is often further aggravated by the incidence of family settlements, which also have to be financed out of the income of the land unless ample money from other investments is available to the inheriting landlord. There seems no escape from the embarrassment of these public burdens so long as the landowner persists " in lumping together his personal or family fortune and the capital of the land industry in which he happens to be engaged." [3] The formation of private limited companies to hold large estates, a number of which have been formed in this country in recent years, goes some way towards overcoming the more serious of the disabilities inherent in the family estate system, especially since such "corporate" estates are not subject to death duties.

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[1] Orwin and Peel, *The Tenure of Agricultural Land*, p. 1

[2] C. Dampier-Whetham, *Politics and the Land*, p. 106

[3] P.E.P. Broadsheet, No. 43, p. 8

But even when these private encumbrances are left out of the picture, it is still true that the landlord has been faced with a marked decline in the size of his net estate income. This net estate income may be defined as the margin between the gross rents of the estate and the legitimate costs and expenses of running the estate as an economic or financial unit. There are four separate categories of estate costs: (*a*) certain statutory fixed charges such as tithes; (*b*) maintenance charges, i.e. costs of repairs and maintenance of houses, buildings, fences, drains, roads, etc.; (*c*) insurance and depreciation; (*d*) professional charges of management. It used to be considered that these outgoings generally amounted to about one-third of the gross rentals, but there is every reason to believe that this proportion has increased substantially on those estates where the landlord has endeavoured to continue to carry out his full duties. This has been partly due to the increase in the cost of certain items, especially maintenance charges, while there has been no corresponding increase in gross rentals. Unfortunately, there is no very reliable or comprehensive statistical information on the exact position, though there is general agreement about the fact. In illustration, figures may be quoted from a comparison of a restricted inquiry of a number of estates in 1929 with a more general inquiry for 1907.[1] In 1929 the outgoings amounted to 10/6 on an average rental of 19/- per acre, as compared with 7/- on an average rental of £1 per acre in 1907. The comparison showed further that in the short period of twenty years the net return on landlord's capital had been more than halved, falling from 5·5 per cent in 1907 to only 2·2 per cent in 1929. Since these figures are based on a small sample they must be treated with caution, but there is reason for believing that they are substantially representative of the general position.

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[1] Dampier-Whetham, "The Economics of Rural Landowning," *J. of A.E.S.*, vol. i, No. 3, 1930

The combined effect of these increases in the personal and in the estate burdens of the private landlord has made it more and more difficult for him to attend even to the bare essentials of the upkeep of the farms on his estate. Minor annual repairs have been neglected with the result that accumulating dilapidations have reached proportions altogether beyond the means of the financially embarrassed owner. In these circumstances it is no wonder if he gives little thought to the acquisition of new capital for tackling the urgent problems of obsolescence and the re-equipment of the farms on his estate so as to enable his tenant-farmers to keep abreast of modern farming developments. It is this inability of the private landowner to face the formidable task of reconstruction and development which constitutes the serious economic feature of the continuance of the landlord-and-tenant system.

In considering the needs of the situation which has arisen it is necessary to examine the conditions which make land management effective in any positive sense. This involves a consideration of estate-managemant in relation to the size and layout of estates as well as in relation to their ownership. But there is a very serious dearth of reliable or comprehensive information about the numbers, sizes and layout of the agricultural estates of the country.

The only statistical information available about the total number of landowners in this country is more than seventy years out of date. It is given in the so-called *New Domesday Book* of 1873. This was an official report which purported to show that there were some 289,000 persons who owned land of one acre and upwards in Great Britain. Of these, 233,000 or 80 per cent, owned less than 100 acres each. At the other extreme 623 persons owned estates of over 10,000 acres in size and these 623 persons owned between them nearly 36 per cent of all the land concerned. On account of its political origin, the evidence of this inquiry has always been statistically suspect, and no attempt has been made to repeat the inquiry or to bring the figures up to date.

The number of agricultural landowners and the size of their agricultural estates for the whole country at the present time is not known. All that can be said is that in 1927 there were 146,887 holdings in England and Wales, and in 1928 14,285 holdings in Scotland which were owned by their occupiers. This gives a minimum of 161,172 separate estates. The remaining 316,374 holdings, accounting for 65·1 per cent of the total cultivated land, were under some form of external ownership, but nothing is known about the total number of the external landlords concerned or the sizes of their estates.

Information about most of the publicly owned estates is, however, available, though it is not possible to distinguish the agricultural land from the non-agricultural land comprising the estates. A comparatively recent estimate (1941) puts the total land in public possession at between three and four million acres, and this comprises approximately 10 per cent of the agricultural land of England and Wales. The largest public estates which have big interests in agricultural land are as follows : (*a*) The Commissioners of Crown Lands who administer about 200,000 acres of farm lands ; (*b*) the Ecclesiastical Commissioners who manage about 265,000 acres of agricultural lands ; (*c*) the Duchy of Lancaster with a total of 43,000 acres ; (*d*) the Duchy of Cornwall with 130,000 acres ; (*e*) Oxford and Cambridge Universities and constituent colleges with 280,000 acres ; (*f*) the County Councils of England and Wales with 465,000 acres ; and (*g*) the Department of Agriculture for Scotland with 432,000 acres. In addition the Forestry Commission owns 990,000 acres, but only a small proportion of this is agricultural land.

It is also possible to obtain some indication of the general position in the nineteen-thirties and forties from the few studies which were made of certain areas of the country. It will be instructive to refer briefly to two of these.

The first study attempted to ascertain the total number and sizes of the agricultural estates in the county of Buckingham in 1936.[1] The total number of separate " estates " was found to be 2,321, but, of these, 1,572 were wholly occupied by their owners, i.e. they were in fact owner-occupied farms. The other 749 estates had a total of 2,338 tenants, but 540 of these estates had only one tenant per estate. From the view-point of estate management the most revealing fact was that 62 per cent of the total number of tenant-farmers in the county were on 73 estates of over 300 acres in size and having more than 3 tenants per estate. Of these 73 estates, 16 were " public " estates, and 57 were " private " estates. Over 30 per cent of all the agricultural tenants in the county were on the 16 estates owned by public or corporate bodies.[2] The 57 private estates covered a total area of 105,400 acres, and had a total of 784 tenants. These estates ranged in size from one estate of 360 acres with 4 tenants to the largest estate of 7,500 acres with 62 tenants. The distribution of the estates according to size was as follows :

Size	*Number of Estates*
300 to 1,000 acres	22
1,000 to 2,000 acres	15
2,000 to 3,000 acres	9
3,000 to 4,000 acres	5
4,000 to 5,000 acres	4
Over 5,000 acres	2
	57

The distribution on the basis of number of tenants per estate showed that 32 estates had less than 10 tenants each, 13 had from 11 to 20 tenants, 7 had from 21 to 30 tenants and 5 estates had more than 31 tenants each. Most of the estates were fairly compact, and several of them were more or less within a ring fence. A few (including one of the largest), on the other hand, were broken and scattered geographically. Their administration was carried out in a variety of ways, 13 being managed by their owners, 22 by a resident agent, 20 by agency firms and 2 by solicitors. No very definite grouping of the owners was possible, but 45 (16 of whom were titled persons) were described as belonging to the "landed gentry" and 6 as persons connected primarily with finance and industry.

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[1] Thomas and Elms, *The Farms and Estates of Buckinghamshire*

[2] The more important public estates were :
Bucks County Council Small Holdings Estate (10,800 acres and 274 tenants)
Middlesex County Council Small Holdings Estate (900 acres and 61 tenants)
The Church (5,000 acres and 113 tenants)
The Crown (4,700 acres and 30 tenants)
Oxford Colleges (16,500 acres and 126 tenants)
Eton College (2,000 acres and 18 tenants)

The second study was carried out in 1941 and was concerned with a survey of some 24 square miles in the south midlands of England.[1] The lay-out of the 123 farms in the region was found to follow no recognizable plan, about half of them being described as inconvenient even for the kind of farming for which they were originally designed. In the study concrete proposals are outlined for converting the 123 existing farms into 28 compact farms which would have properly sited buildings and roads and be convenient to work. But any such comprehensive regrouping would have to overcome the formidable obstacle presented by the existing kaleidoscopic ownership of the land. The ownership of 115 of the farms was ascertained and 112 different owners identified. About one-third of the region was held by 5 owners whose estates were over 500 acres, a quarter of it by 14 owners whose estates were between 200 and 350 acres, another third by 40 owners each holding between 50 and 200 acres, and the remaining 8 per cent by 53 owners, none of whom owned more than 50 acres within the region of the survey. Of the 115 farmers, 80 were either their own landlords or farmed under one landlord each, 25 had 2 landlords each, 8 had 3 landlords each and 2 had 4 landlords each. The extraordinary diversity of ownership is well illustrated by the fact that a straight line running for 6 miles diagonally across the area cut 27 farm boundaries and passed over no fewer than 23 different ownerships.

[1] C. S. Orwin (Editor), *Country Planning* (Oxford 1944)

The evidence of these studies, and especially the second, illustrates in a very vivid manner, the virtual impossibility of undertaking any constructive land management policy within the existing framework of landownership. There has never been any real study of the optimum unit for the exercise of estate management. But large areas of land under unified control are obviously essential for effective administration as well as for any replanning necessary in the interests of farming efficiency. Moreover, large financial units are also necessary if capital on anything like an adequate scale is to be forthcoming to re-group and equip farms with the up-to-date buildings, water-supplies, electricity, etc. which modern farming technique requires. But readjustments involve the sacrifice of much fixed capital, while the return on the new capital sunk will be so modest and of such a long-term character that private enterprise, whether of the personal or the corporate variety, is hardly likely to be attracted by it. Indeed many argue that the State alone is in a position to undertake such " an unavoidably bad investment." Moreover, land is in many ways a privileged commodity, and land administration and planning affect not only agriculture but almost every economic activity. Hence the argument for some form of public ownership of the land to enable it to be administered as a public utility service.

In this connection it is of interest to note certain powers which are vested in the State by the Agriculture Act, 1947. The first is the power to acquire land compulsorily for the purpose of developing it so as to ensure its full and efficient agricultural use in the national interest. This power is intended to deal with " certain areas of land in this country which, for one reason or another, cannot be properly developed and used for agricultural purposes without a great deal of equipment and other work, involving expenditure which could not reasonably be expected of any private individual." Secondly, the Minister of Agriculture and Fisheries is given powers to carry out experimental schemes for the re-adjustment of farm boundaries, and to prevent the splitting up of farms into uneconomic units through land speculation or other causes. Finally, the Minister of Agriculture and Fisheries with the Minister of Town and Country Planning and other Government Departments can take action to ensure that good agricultural land is not unnecessarily diverted to some non-agricultural purpose if other poorer land could equally well be used.

From the view-point of the economics of agriculture the nominal ownership of the land is of secondary consideration provided the control of land-use combines a reasonable measure of stability with the degree of elasticity necessary for the full adoption of developing agricultural techniques. But the control of land-use also involves the guardianship of the long-term properties of the land itself, and this guardianship was regarded by the best of the old landlords as one of their most important functions. In addition to the encouragement of good farming practices, this function also demands the prohibition of farming systems which, regardless of whether they are or are not financially successful, are calculated to depreciate the permanent equipment of farming and to injure the capacity of the land itself as a factor of production in agriculture.

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CHAPTER IX

AGRICULTURE AND THE GENERAL PRICE LEVEL

So far the internal economic problems of the farm and the general economic structure of the agricultural industry have been considered more or less in isolation. We must now consider outside influences to which hitherto only occasional reference has been made.

In an exchange economy by far the most important of these external influences are the movements of prices, *because they are the means through which the external economic forces are focused on the industry and on the farm unit.*

There are two distinct kinds of price movements, and it is important to distinguish clearly between them.

In the first place the prices of most things may move for a number of years more or less together and in the same direction. For example, between 1875 and 1895 the price of potatoes dropped more or less continuously; but during the same period the prices of most other things also dropped. As a result the price of potatoes did not change much in relation to the prices of other things, i.e. the *purchasing power* of potatoes remained much the same although potato prices changed. These general movements of all prices together are caused by changes in the value of money. They are variously described as movements in the general price level, or movements in the purchasing power of money, or movements in the cost of living. Their distinguishing feature is that they affect all prices, and therefore influence all sections of the community whether they are producers or consumers, agriculturists or non-agriculturists.

Secondly, there are the changes in the prices of individual commodities which are not associated with corresponding changes in the prices of all commodities; i.e. the price of any one thing which is bought or sold may go up or down without regard to the prices of other things. For example, in 1930 the average price of potatoes was about 80/- per ton ; in 1931 it was 150/- per ton. But there was no comparable change in the prices of other products between these two years. In other words, the change in potato prices was something peculiar to potatoes, and was governed by the conditions of the supply of, and the demand for, potatoes alone.

The present chapter deals with the first type of price movements (i.e. with movements in the general level of all prices) and with the influence of such movements on the agricultural industry.

INDEX NUMBERS

At the outset, it will be helpful to explain briefly how movements of prices are measured by the use of index numbers. There are several well-known series of index numbers of which the more important are the cost-of-living index of the Ministry of Labour, the Board of Trade's index of wholesale prices, the index number prepared by *The Economist* and Sauerbeck's index, now published in *The Statist*. All these index numbers are measurements of changes in the general level of prices. But there are other index numbers which deal with movements of special groups of prices only. The student of agricultural economics is particularly concerned with the three series of index numbers of agricultural prices which have been prepared since 1913 by the Ministry of Agriculture and Fisheries. These index numbers measure changes in the prices of (1) the agricultural produce sold by the farmer, (2) the feeding-stuffs purchased by the farmer, and (3) the fertilizers purchased by the farmer. These agricultural index numbers are published monthly in the *Journal of the Ministry of Agriculture and Fisheries*, and annually in *Agricultural Statistics*.

Index numbers of prices, like all index numbers, are both averages and percentages : i.e. they are designed to show the average price level of a group of commodities at one period as a percentage of the average price level at another period, the latter being usually called the base period. In this way the device of index numbers reduces to simple proportions a vast amount of conflicting and non-comparable price data. The data are conflicting because from year to year the prices of some of the commodities studied may rise while the prices of the others may fall. The data are non-comparable because prices are quoted in all sorts of denominations, e.g. wheat per cwt., milk per gallon, eggs per score, cattle per head, and so forth. It is the purpose of index numbers to bring all prices to a common denominator, and so to show in a form which can be readily grasped a comparison of price movements from month to month or from year to year.

The essential principle on which price index numbers are calculated is best explained by means of a simple hypothetical illustration. Suppose that we are attempting to construct a wholesale price index for a group of three agricultural commodities—say wheat, milk and eggs—for the period between 1930 and 1935 using the year 1930 as the base year. The first step is to ascertain from market reports what is the average wholesale price of each of the three commodities for each of the six years. Suppose these prices are as follows :

Year	Average annual wholesale prices		
	Wheat	Milk	Eggs
1930	9/2 per cwt.	12/8 per gallon	17/9 per score
1931	6/1 ,,	11/6 ,,	15/- ,,
1932	6/1 ,,	10/6 ,,	13/4 ,,
1933	5/6 ,,	10/6 ,,	12/11 ,,
1934	4/9 ,,	11/5 ,,	12/6 ,,
1935	5/- ,,	11/- ,,	12/9 ,

The second step is to express the average price for the base year for wheat, milk and eggs respectively as 100, and then to calculate the corresponding prices for the other years for each of the three commodities in terms of a price of 100 for the base year. The results are as shown in the following statement :

Year	Commodity Index			Total	Group Index
	Wheat	Milk	Eggs		
1930	100	100	100	300	100·0
1931	66	91	85	242	80·7
1932	66	83	75	224	74·7
1933	60	83	73	216	72·0
1934	52	90	70	212	70·7
1935	55	86	72	213	71·0

In this table the conflicting and non-comparable price data set out in the first table have been reduced to a simple uniform series. Thus an annual index number is shown for each of the three products as well as an index number for the group as a whole. The composite or group index numbers are obtained by adding the three product indices and dividing the totals by three. From the product index numbers we can say at a glance that between 1930 and 1935 the price of wheat fell by 45 per cent, the price of milk by 14 per cent and the price of eggs by 28 per cent. Likewise the composite index numbers, shown in the last column, enable us to say at once that between 1930 and 1935 the prices of these products as a whole fell by 29·0 per cent.

This is, of course, an over-simplified statement of the calculation of composite index numbers, but it is the method in its general outline. There is, however, one important refinement in general use for the purpose of giving due regard to the *relative* importance of the products within the group for which the price index is being constructed. This is done by the method of *weighting*. The greater the importance of any one product in relation to the others the greater should be the weight assigned to it. For example, in constructing the agricultural index more weight should be given to livestock and livestock products than to cereals, because, on the average, livestock are more important than cereals in the agricultural output. Having fixed on the weights, each individual index is then multiplied by its appropriate weight, and the sum of the results is divided by the sum of the weights to give the composite index. The weighted index thus obtained is influenced to a greater extent by the prices of the commodities whose weights are large than by those whose weights are small.

In constructing a price index the more important practical considerations which need careful attention are (*a*) the choice of the base period, (*b*) the choice of the commodities included, (*c*) the system of weighting, and (*d*) the reliability of the price quotations on which all the calculations are made. It will be instructive to illustrate the importance of these four considerations in relation to the construction of the agricultural price index number in this country. The Ministry of Agriculture's index number of the wholesale prices of agricultural products goes back to 1906, but in 1938 the original series was superseded by a new series of index numbers. The reasons for the change are intimately related to the four considerations enumerated above.[1]

(*a*) *Choice of the base period.* The general principle is that the year or years selected as the base period should be years in which economic conditions were comparatively normal. Before 1938 the base period from which the price changes were measured was the three years from 1911 to 1913, average prices during that period being equated to 100. It was held to be more convenient and to give a clearer picture to measure price changes from a more recent period, and for the new series introduced in 1938 the base period became the average of the three years from 1927 to 1929. The chief reason for this alteration was the need to reflect the important changes which had occurred since 1914 in the constitution of the agricultural output as well as in the value of money. Having decided to change the base years, however, the important point was that the new base should include years reasonably free from wide fluctuations of prices. This was the case for the three years 1927, 1928 and 1929 when prices were more reasonably constant than in the subsequent period of years.

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[1] C. T. Houghton, "A New Index Number of Agricultural Prices," *J. of R.S.S.*, vol. ci, Part II, 1938

(*b*) *Choice of commodities.* Here the general principle is that the commodities chosen should be as widely representative as possible of the universe. The universe in this case is the prices of all the important commodites sold off farms in this country, since the agricultural index attempts to measure the overall influence of price changes on farmers' incomes. When the change in the series was made in 1938, certain new products were added to the list, notably sugar-beet (which became important in English agriculture after 1924), glasshouse produce and certain vegetables. On the other hand, winter beans and field peas were dropped since they had ceased to be important products in British farming. The list of products included in the present index (see Table XI overleaf) covers all the important items of the agricultural output of the country in the nineteen-thirties.

(*c*) *System of weighting.* The general principle is that not only is it necessary to select the prices of as representative a number of products as possible, but due regard must also be given to the relative importance of the products selected.

The original agricultural index was calculated by weighting each product index by the estimated value of the output of that product in 1908. This meant that the weights used reflected the relative importance of the different products in the agricultural output of the country in 1908 ; but in view of the great changes which had occurred in the output of British farming since 1908, such a system of weighting was becoming increasingly unrealistic and out-of-date. For the new series a system of moving weights was introduced. Each individual commodity index is now weighted in proportion to the value (at the prices of the base period, 1927–29) of the output of that commodity over the five most recent crop years. For example, for the year 1938 the weights were derived from the average quantities of output during the crop years 1932/33 to 1936/37, valued at the prices of 1927–29 ; while for 1939 the weights were calculated in a similar way from the output of the crop years 1933/34 to 1937/38, and so

TABLE XI—Index Numbers of Prices of Agricultural Products

Commodity	1930	1931	1932	1933	1934
Wheat	80	56	56	49	47
Barley	80	80	71	83	86
Oats	68	68	74	61	69
Fat Cattle	100	91	86	76	75
Fat Cows	101	88	79	68	67
Fat Sheep	100	84	63	71	80
Fat Ewes	103	82	61	64	73
Fat Lambs	100	89	66	69	79
Bacon Pigs	104	74	63	70	77
Pork Pigs	108	80	65	71	78
Sows	112	73	60	70	75
Milk	95	82	84	84	88
Butter	87	76	70	65	61
Cheese	83	81	81	65	54
Poultry	97	93	84	80	78
Eggs	91	77	72	71	68
Potatoes	56	132	141	63	68
Hay	101	74	60	63	80
Fruit	77	93	106	88	75
Vegetables	93	89	84	87	85
Glasshouse Produce	100	97	109	99	88
Sugar-beet	93	79	80	74	76
Wool	56	35	31	45	54
Hops	43	73	95	165	97
Cereals and Farm Crops	73½	88	89	70½	71½
Livestock and Livestock Products	96½	81	75	74½	77½
Fruit, Vegetables and Glasshouse Produce	86½	92	97	89	81
General Index	91	83½	80½	75½	77
Revised Index *			81	77	78½

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* Taking account of payments under the Wheat Act, the Cattle Subsidy, and Government payments for milk

in England and Wales, 1930 to 1939 (Base : 1927–29 = 100)

Commodity	1935	1936	1937	1938	1939
Wheat	51	71	90	59	50
Barley	80	86	109	84	105
Oats	71	70	92	79	79
Fat Cattle	69	73	82	84	86
Fat Cows	61	63	74	77	80
Fat Sheep	82	80	90	69	76
Fat Ewes	73	73	82	70	73
Fat Lambs	75	80	89	69	75
Bacon Pigs	70	78	83	84	87
Pork Pigs	71	75	81	83	86
Sows	64	67	81	83	91
Milk	85	85	94	100	98
Butter	62	65	73	75	77
Cheese	49	58	80	75	73
Poultry	80	78	82	86	88
Eggs	72	78	83	85	87
Potatoes	84	122	120	87	82
Hay	86	76	79	73	93
Fruit	118	79	91	124	80
Vegetables	94	91	93	91	93
Glasshouse Produce	93	95	98	98	100
Sugar-beet	72	74	75	86	93
Wool	54	60	94	51	62
Hops	97	97	97	97	101
Cereals and Farm Crops	76	90	97½	80	82
Livestock and Livestock Products	74½	77½	86½	86	88
Fruit, Vegetables and Glasshouse Produce	104	86	93	105½	88½
General Index	78½	80½	89	87½	87
Revised Index*	81	82½	90½	90	90½

* Taking account of payments under the Wheat Act, the Cattle Subsidy, and Government payments for milk

forth.[1] (The weights used are published each year in *Agricultural Statistics.*) In this way the system of weighting takes account of the gradual variations which occur in the relative importance of the various commodities. It therefore enables the series of index numbers " to run on indefinitely without being increasingly divorced from the contemporary output of agriculture."

(*d*) *Price quotations used.* The reliability of any index of prices will obviously depend on the accuracy of the price quotations on which it is based. In the calculation of the agricultural index the wholesale prices used are those of first sale by the farmer, and in most cases the mean of the prices of first and second quality products. For most products the prices used are the average weekly prices as ascertained by the special market reporters maintained by the Ministry of Agriculture at all the important agricultural markets in the country. Up to its suspension in 1939, these average prices were published weekly in the *Agricultural Market Report* issued by the Ministry of Agriculture. Since the prices used are market prices, and not " farm-gate " prices, they include an element of marketing and transport costs in so far as these have been incurred by the farmer himself. In the case of products such as milk and hops, the prices used are those fixed by the marketing organizations for these products.

The index numbers of the wholesale prices of agricultural products in England and Wales for the period 1930 to 1939 are shown in Table XI. It may be useful to indicate briefly what one can learn from such a series of index numbers.

In the first place, the general agricultural index measures as accurately as possible the influence of price changes on the value of the output of the agricultural industry from year to year. The agricultural index in 1930 was 91 and it was 87 in 1939. What do these figures mean? They mean that between 1930 and 1939 the value of what might be described as a representative lorry-load of farm products (i.e. a load containing each of the products used in the compilation of the index in the proportions used for weighting) decreased by four points, *or by 4·4 per cent.* In this sense the figures reflect the influence of price changes on the value of the agricultural output.

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[1] *Index Number of Agricultural Prices* (Ministry of Agriculture and Fisheries, 1938), p. 6

But it is necessary to emphasize that the price index does not itself constitute an index of the value of the total agricultural output of the year. This is because the value of the total agricultural output, or of gross farm sales, is influenced by other factors besides the prices of farm products; of these the volume of sales is the most important. The price index does not take these other factors into account. It is also necessary to emphasize that the price index in itself is not an index of the total agricultural income or a measure of the profitability of the industry. Nevertheless, it does provide an important guide to agricultural prosperity from year to year in so far as such prosperity is determined by changes in prices.

While the price index shows how farmers in general are faring as a result of a change in the general price level, it does not, of course, follow that all farmers suffer changes to that degree. On the contrary, the position of individual farmers is governed by the prices of the products which each farmer himself has to sell, and not by the prices of all the products which are sold by the farming community. Since separate annual index numbers are available for each of the important products of agriculture, as well as for groups of products, it is possible to compare in a broad way the influence of price changes on the position of individual farmers or groups of farmers. For example, Table XI shows that during the nineteen-thirties the general fall in agricultural prices was a much more serious matter for the arable farmers than it was for the horticulturists and the livestock producers. Thus the index for cereals and farm crops dropped by 8·2 per cent between 1930 and 1939 but the index for fruit, vegetables and glasshouse produce increased by 2·3 per cent, and the index for livestock and livestock products increased by 8·2 per cent.

Finally, in a similar way the index of wholesale prices of farm products can be compared with the index of wholesale prices of manufactured articles or with the general index of retail prices. Such comparisons give a broad indication of the relative effect of price changes on the fortunes of agriculturists and on the fortunes of other sections of the community. The rest of this chapter is mainly concerned with such comparisons.

CHANGES IN THE GENERAL LEVEL OF PRICES

It is a familiar fact of economic history that over a long period of years there has been a tendency for the general level of prices to show unmistakable fluctuations. In other words, there have been periods during which there has been a tendency for most prices to move in the same direction, up or down, at the same time. These alternating periods of rising and falling prices are well illustrated in all the important series of price indices which are available.

For example, an examination of the index of wholesale prices from 1820 onwards shows the following general price movements to have occurred.[1] The thirty years from 1820 to 1850 constituted a period of falling prices. There followed twenty-five years of a rising tendency. After 1874 prices fell again for a period of twenty-two years, but between 1896 and the outbreak of war in 1914 there was a general rise of prices. Since 1914 the fluctuations in general prices have been more violent and have succeeded each other more rapidly. Thus the First World War was accompanied by an unprecedented upward movement, and by April 1920 the index of wholesale prices was 223 per cent above the 1914 level. This rise was followed by a very rapid fall of 50 per cent in the short period between April 1920 and February 1922. There was a further fall of 9 per cent by March 1929. The great depression which set in in 1929 accentuated the downward trend, and there was a further fall of 34 per cent between March 1929 and December

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[1] Layton and Crowther, *An Introduction to the Study of Prices* (London 1935), Chapter III

1933. This was followed by a period of gradual recovery, and, by the outbreak of the Second World War in August 1939, the index was 10 per cent above the 1933 level. War-time conditions spurred the upward trend and between August 1939 and December 1945 the general level of wholesale prices advanced by 70 per cent.

The periods of rising prices mentioned above were periods when the value of money was relatively low because money was relatively plentiful ; the periods of falling prices were periods when the value of money was relatively high because money was relatively scarce.

It is not usual to think of the value of money as being high or low, though in recent years we have had ample experience of the fact. For example, we say today that the £ is not worth as much as it was in 1939. What does this mean ? It means that the value of the £ as measured by its purchasing power, i.e. the amount of goods and services which can be bought with it, has fallen. Why has it fallen ? The simple answer is that it has fallen because today there are far more £'s relatively to the goods and services which are bought and sold, than there were in 1939. This is the same as saying that the value of money, like the value of everything else, depends upon its relative scarcity.

The relative scarcity of money, like the relative scarcity of everything else, is determined by the relation between supply and demand.

The supply of money in this connection means the entire purchasing power of the community. This, in turn, is determined by two factors. The first factor is the total quantity of money and credit in circulation. This includes cash, notes and the bank deposits upon which cheques may be drawn. The second factor is the velocity of circulation, i.e. the number of times these different types of money change hands through the sales and purchases made by the community over a period. For instance, a £1 note changes hands many times in the course of a year, and a £1 note changing hands five times will cover as many transactions as one £5 note used once only.

Since money is needed to buy and sell goods and services, the demand for it in any period will be determined by the amount of buying and selling to be accomplished. The sum total of this demand therefore will depend upon (*a*) the amount of goods and services to be bought and sold, and (*b*) the number of times they are bought and sold within the period. In the main this means that the demand for money depends upon the *volume of trade* required for both production and consumption during the period.

This relationship between the supply of money and the demand for it is usually expressed in the form of the equation : $P = \frac{MV}{T}$. In this equation P represents the general price level, M the quantity of money and credit in circulation, V the velocity of circulation of that money and T the volume of goods and services bought and sold. It is clear that any change in the quantity of money (M), or in the rapidity of its circulation (V), which is not accompanied by a proportionate change in the volume of trade (T), or vice versa, will change the general price level (P). Thus a greater abundance of money or a greater scarcity of goods will lead to a higher price level (i.e. will lower the value of money), while a greater scarcity of money or a greater abundance of goods will lead to a lower price level (i.e. will raise the value of money).

It is such unequal or opposite changes in the demand for money and in its supply which explain the trend of prices described above. The two periods before and after 1920 may be taken to illustrate the general principle. The inflated prices which characterized the years from 1914 to 1920 were the results of an increase in the supply of money occurring contemporaneously with a decrease in demand. The enormous increase in supply was brought about by the printing of paper money. The decrease in demand reflected the scarcity of goods following on the necessity to restrict production to the needs of war. A contrary set of conditions brought about the deflation of prices in the nineteen-twenties. Thus production and trade were returning to normal and thereby increasing the demand for money, but at the same time the supply of money was being reduced through the calling in of paper money and the restriction of credit by the banks. Before 1920 money was relatively abundant and prices were high, after 1920 money was relatively scarce and prices were low.

This explanation of the reason for changes in the general level of prices is the basis of the so-called *quantity theory of money*. The above statement of it has, of necessity, been brief and much over-simplified, but the theory can be defined in the following general terms : the general level of prices tends to vary *directly* with the supply of money (i.e. with the quantity of money and the rapidity of its circulation) and *inversely* with the demand for money as indicated by the number of units or items of exchange multiplied by the prices at which the exchanges are carried out. In the words of Lord Keynes, " this theory is fundamental. Its correspondence with the facts is not open to dispute."

But there are fluctuations in the general level of prices which are far from being adequately explained in terms of the quantity theory of money. These fluctuations are associated with the so-called *trade cycle*, i.e. the fairly regular recurrence, every seven or eight years, of alternating periods of prosperity and adversity which has characterized all business activity during the industrial era. These cycles have been reflected in corresponding cycles of rising and falling prices, being superimposed on the long-period movements of prices described above. The periods of prosperity have been characterized by rising prices, mounting production and fuller employment ; the periods of adversity, on the other hand, have been characterized by falling prices, curtailed production and unemployment. So much can be established, though it is not possible to distinguish between cause and effect.

Fluctuations in the general level of prices, and especially the trade cycle, have exercised the minds of economists for a long time. A discussion of the phenomenon will be found in all modern economic textbooks, as well as in a number of books devoted entirely to it. Here we are concerned only with the influence of these fluctuations on the conditions of agriculture.

Effects of General Price Changes

Before considering the economic consequence of changes in the general level of prices it may be well to emphasize once more that these changes have had their counterpart in closely similar changes in the general level of agricultural prices. The parallel between the two is illustrated in Diagram I, which shows the curve of the general price index alongside the curve of the agricultural price index. The coincidence of the two curves is sufficiently pronounced to warrant the generalization

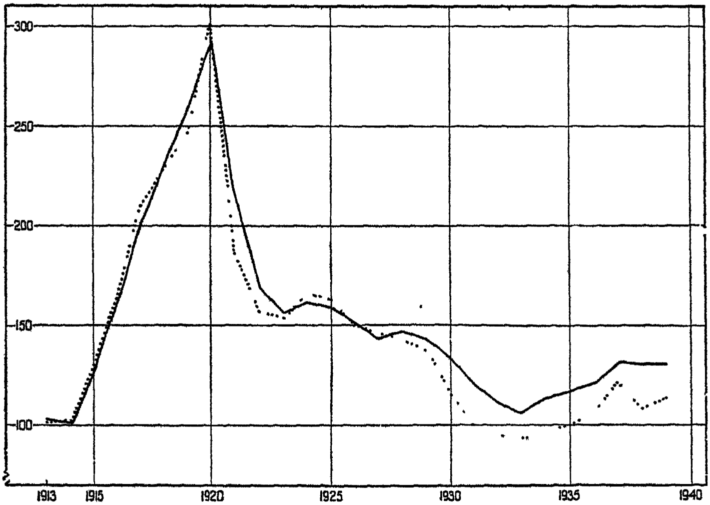

Diagram I

The trend of prices of agricultural products and wholesale commodities—1911–13 = 100

—— Ministry of Agriculture index number of agricultural products

. . . . *Statist* index number of wholesale prices that " the fluctuations in agricultural prices as a whole have been in fairly close harmony with those of the general price level ; in other words, the causes which have operated to bring about a rise or fall in the general price level have also operated to bring about similar changes in agricultural prices." [1]

These movements have had a profound effect on the fortunes of agriculture. As the general price level has risen or fallen so have the fortunes of farmers moved successively from prosperity to adversity. It is even possible to divide the history of farming during the past hundred years into fairly distinct periods of prosperity and adversity according to the trend of the general price level. These periods are as follows :

Period	Trend in General Price Level	State of Agriculture
1850–1874	Rising	Prosperous
1874–1896	Falling	Depressed
1896–1914	Rising	Prosperous
1914–1920	Soaring	Very prosperous
1920–1933	Falling rapidly	Depressed
1933–1939	Rising slowly	Recovering
1939–1945	Rising rapidly	Prosperous

This interpretation of agricultural history gives point to the contention which is often made that changes in the value of money have been the most important single factor responsible for the changes which have occurred in the fortunes of agriculture.

Changes in the general level of prices have important effects on all classes in the community as, for example, on those with fixed incomes. People who have fixed incomes will benefit from a fall in prices and lose by a rise in prices. Their incomes buy more goods and services in the first instance and less in the second instance. Other classes in the community with varying kinds of incomes are affected in other ways.

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[1] *Report of the Committee on Stabilisation of Agricultural Prices* (Ministry of Agriculture and Fisheries Economic Series, No. 2, 1925), p. 7

Agriculturists belong to a class of people whose gross incomes rise with rising prices, and fall with falling prices. But the rises and falls of prices and incomes do not necessarily synchronize.

The factor which prevents income and price changes from synchronizing is the fact that all prices do not move to the same extent or at the same rate. In other words there is a difference in the *amount* of the rise and fall as well as a difference in the *timing* of the rise and fall. Three important generalizations can be made in this connection. First, wholesale prices tend to fluctuate more than retail prices, which take longer to rise and do not fall so rapidly. Secondly, the prices of raw materials fluctuate more rapidly than do the prices of manufactured goods. Thirdly, there is a tendency for the prices which determine the level of the farmer's costs to be more rigid than the prices which determine the level of his returns. It is this disparity between the ups and downs of costs and returns during general price changes which accounts for the great significance of such changes to agriculturists.

The chief factors responsible for this disparity of costs and returns are as follows : (1) Payments fixed by contract, such as rent, interest or mortgage charges, are important items of costs in agriculture which are hardly affected by general price changes. (2) Non-paid family labour, which accounts for the bulk of agriculture's labour force, is immune to price changes. (3) The wages bill for hired workers, now that wages are fixed by law, may also be regarded as a more or less static charge. (4) Costs of other services such as middlemen's charges, veterinary fees, etc. are sluggish especially when prices fall. (5) The remaining items of costs are mainly in respect of purchases of requisites such as feeding-stuffs, manures and equipment which are manufactured articles purchased, moreover, by the farmer at retail prices. (6) Finally, most of the goods the farmer sells are unfinished products or raw materials which are sold, in the main, at the wholesale level.

The combined result of these several factors is that, on the whole, the level of farm costs, whether in a rise or in a fall of

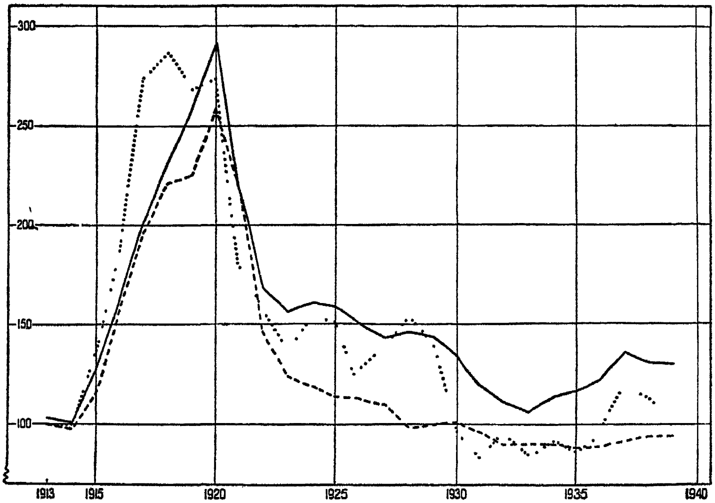

DIAGRAM II

The trend of prices of agricultural products, feeding-stuffs and fertilizers—1911–13 = 100

—— Index of prices of agricultural products
.... Index of prices of feeding stuffs
---- Index of prices of fertilizers

prices, tends to move more slowly than the level of farm prices. The general position is illustrated by the curves in Diagram II. These curves compare the movements of general agricultural prices with the movements of the chief cost items for which index numbers are available, i.e. fertilizers and feeding-stuffs. It will be seen that the lag in the movements of the cost items is more pronounced in periods of falling than in periods of rising prices. Consequently the disadvantage of the lag to the farmer when prices fall tends to outweigh any advantage which may be conferred when prices move upwards.

This general situation is further aggravated by the slow turnover of the farming industry. Where there is a rapid turnover there is less time for costs and prices to get seriously out of alignment. But when prices are changing, the farmer, with his slow turnover, incurs his costs at one level of prices and sells his produce months or even years later at a different level of prices. This time lag between costs and returns tends to increase profits when prices rise, and to depress profits when prices fall. If the fall is very rapid as it was, for example, between 1920 and 1923, the farmer may lose most of the profits which it was legitimate for him to expect when he started the production process. On the other hand, it should be remembered that in so far as the farmer is a self-supplier of a lot of his raw materials much of what he is supposed to lose by this lag in periods of falling prices is not reflected in actual loss of cash profits.

It remains to consider some of the more important implications of the fluctuations associated with the trade cycle on the agricultural industry. In an exchange economy it is inevitable that agriculture should be affected intimately by these cycles. Periods of boom and slump in industry generally have their counterpart in periods of prosperity and adversity in agriculture. Nevertheless, the behaviour of agriculture differs in important respects from the behaviour of other industries because in agriculture both production and employment show a different response to the cyclical movements of general prices.

It was stated earlier that one of the important features of the ups and downs of the trade cycle in industry generally is the fluctuation in the total volume of production. In contrast, the total volume of production in agriculture remains remarkably stable from year to year. This means, in effect, that agricultural supply is less sensitive to general price changes. For various reasons—technical, economic and psychological—agriculture tends to go on producing the same quantities of produce even when falling prices suggest that output should be curtailed.

The technical reasons are associated with the biological character of agricultural production which renders it very difficult for the farmer to alter his programme of production often or at short notice. Once the process of growing crops or of breeding animals is started it cannot be slowed down or speeded up for the season concerned. Furthermore, the intricate organic inter-relationships of the farm are essentially of a long-period character, and changes of tempo may easily damage the potential capacity of the whole farming system This is especially true so far as slowing down production is concerned. If the land is not cultivated its fertility will deteriorate, weeds will grow, drains will get out of action and so forth. The depletion of soil fertility may require several growing seasons to repair, and the process of bringing the land into full production at a later stage may prove a long and costly process. Likewise, the farmer who has bred livestock of high quality will think twice before he reduces the size of his herds and his flocks or does anything to damage their distinctive achievements. Indeed the rebuilding of depleted herds and flocks may prove a longer and costlier process even than the restitution of crop production.

These technical considerations are not unconnected with the economic factors making for the comparative rigidity of the total agricultural output. The important consideration here is the relation of fixed to prime costs in agriculture. Changing the volume of production is the result of changing the inputs of prime costs, since fixed costs remain constant irrespective of the volume of production. But "since prime costs represent only a small part of total farming costs, the savings open to the farmer through decreasing output are small, so that it is not likely to contract much ; this is especially true since prime costs per unit will often be rapidly reduced as farming becomes less intensive, and the scope for savings will consequently diminish. . . . Similarly, when price rises, there may be some expansion of output through the hiring of more prime factors. But, owing to the tendency to diminishing returns as labour, feeding-stuffs or fertilizers are used more intensively, it will not be worth the farmer's while to increase production as much as he would if costs were constant." [1]

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[1] R. L. Cohen, *The Economics of Agriculture*, pp. 107–8

In this way the high ratio of fixed to variable costs acts as a strong incentive to the farmer to keep his output fairly constant notwithstanding changes in price. This incentive is most powerful in the case of the small family farmer using no hired labour and purchasing relatively little raw materials.

The resistance to changes in the volume of output, especially downwards, which is set up by these technical and economic factors is reinforced by the psychological reaction of thousands of entrepreneurs acting more or less independently within their small family businesses. The primary incentive of the family farmer is the maintenance of the family income. When prices fall, therefore, the output of the family farm is quite likely to increase rather than to decrease since the amount produced is determined mainly by the work done by the farmer and his family. In other words, by working harder and producing more the family farmer hopes to make up in a bigger volume of sales what he loses in the price of his products. Likewise, it is often stated that when prices rise the family farmer may be less inclined to increase production in order to take full advantage of the higher prices. This is because he finds himself able to maintain his income, and even improve on it, by working the same amount and by selling the same quantity of produce from his farm as he did previous to the rise.

The family structure of farming also supplies the chief explanation for the different employment behaviour of agriculture and manufacturing industry especially during the downward phase of the trade cycle. Where the bulk of the labour force is recruited from the ranks of the entrepreneur's family there is no question of the dismissal of workers during a depression. Hence the rapid rise of unemployment in manufacturing industry has no exact counterpart in agriculture.

The combined result of these technical, economic and psychological factors is reflected in the fact that the short-term fluctuations of prices associated with the trade cycle are accompanied in agriculture not by corresponding fluctuations in output and employment, but by fluctuations in total farm profits or incomes. While agriculture may avoid actual unemployment, this is only done at the cost of the reduction of the standard of living of farmers and their families. In other words, poverty in agriculture is the counterpart of unemployment which is more a phenomenon of manufacture and commerce.

This difference in the behaviour of agriculture and manufacturing industry has an important bearing on the contribution of the two classes to the making and mending of trade cycles. In the downward phase of the cycle agriculture maintains employment and output but for a ruinous return; manufacturing industry, on the other hand, manages to retain a relatively high level of wages and prices, but at the cost of unemployment and the curtailment of output. " When a situation of this sort has developed, the interests of the two sections appear to be directly antagonistic to each other. The farmer calls for higher prices, even at the cost, if need be, of some restriction of production. The industrialist wants a higher volume of demand at the prevailing level of prices.

But it does not take an economist to see that in the long run the prosperity of each class depends upon the prosperity of the other. As the farmer recovers prosperity, the manufacturer may not gain much in price, but he will benefit by being able to sell a larger volume; and as the manufacturer recovers his prosperity, the farmer may not sell a much larger quantity, but he will get a higher price for it." [1]

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[1] Geoffrey Crowther, *An Outline of Money* (London 1940), p. 372

(For Bibliography see pp. 225–6)

CHAPTER X

PRICES, DEMAND AND SUPPLY IN AGRICULTURE

IN this chapter we are concerned with changes in prices which are due, in the main, to the functioning of the price system as the guide to economic activity. This was the function referred to in the first chapter of this book where it was stated that, under conditions of free competition, the price mechanism is responsible for equating demand and supply thereby ensuring that economic resources are used to the best advantage.

The principles on which the price system is supposed to perform this all-important function are discussed in every textbook on economics. They can be stated in the following three simple propositions :

(*a*) When the demand for a product exceeds its supply its price tends to rise ; when the supply of a product exceeds the demand for it, its price tends to fall.

(*b*) When the price of a product rises its supply tends to increase and the demand for it to decrease ; when the price of a product falls its supply tends to decrease and the demand for it to increase.

(*c*) Changes in the demand for a product without compensating changes in its supply will cause changes in its price ; changes in the supply of a product without compensating changes in the demand for it will cause changes in its price.

The first proposition emphasizes the all-important concept that the price of a product is governed by its relative scarcity. The second proposition expresses the direct reaction of sellers to a change in price, and the inverse reaction of buyers. In the third proposition the emphasis is on the influence of demand and supply on prices and not on the influence of prices on demand and supply.

In considering the automatic working of the free-price mechanism in agriculture it will be convenient to distinguish between the following four relationships : (*a*) the influence of price on demand ; (*b*) the influence of demand on price ; (*c*) the influence of price on supply ; and (*d*) the influence of supply on price. In the following sections these four relationships are treated separately and more or less in an unrelated fashion It is necessary to emphasize, however, that this is entirely a matter of convenience, for in practice these four relationships are inextricably interdependent, forming together the complex whole of the general economic situation.

INFLUENCE OF PRICES ON DEMAND

A discussion of the influence of price changes on the demand for a product resolves itself into a discussion of the *elasticity of demand* for the product concerned. The concept of elasticity of demand was expressed by Marshall as follows : " The elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price." Elasticity and inelasticity are precise and measurable things. The elasticity of demand is usually now taken as the percentage change in demand resulting from a 1 per cent change in price. If this is greater than 1, the demand is elastic ; if it is less than 1, the demand is inelastic. It needs to be emphasized that in considering the elasticity of demand we are solely concerned with the influence of price changes, i.e. we are concerned with the demand situation when all the other factors influencing demand, other than price, are assumed to be constant.

It is generally stated that the demand for agricultural products taken as a whole is inelastic, i.e. a rise or a fall in the prices of farm products does not cause a proportionately greater fall or rise in the amounts demanded. This generalization is made on the assumption that agriculture is mainly concerned with the production of the staple articles of food, which constitute the most essential of all the necessities of life. In the case of a product which is a necessity, or which is looked upon as a necessity (which amounts to the same thing), one would normally expect the demand for it to be inelastic, because people have got to get it, or feel that they have got to get it, irrespective of small changes in price. For example, if the prices of essential foods rise, consumers will attempt to avoid any diminution in their total consumption of food even if that means economizing generally on their purchases of less urgent necessities and on comparative luxuries. On the other hand, if the prices of essential foods fall people will not eat much more of them since there is an obvious physical limit to the expansion of food consumption by the individual. In other words, the elemental importance of food to life means that the demand for it, on the whole, is fairly constant and, therefore, inelastic.

While this broad generalization may be true of the elasticity of demand for food products in the aggregate, it has in fact little practical significance since food " in the aggregate " is never sold on the market. Moreover, what may apply in theory to the elasticity of demand for food " in the aggregate " is by no means applicable to the elasticity of demand for any single food product. This is not surprising when it is remembered that the food products of agriculture exhibit a wide range from staple necessities to luxury items. Moreover, agriculture produces non-food products as well as food products, while many of the food products may be put to other than culinary uses. It is necessary, therefore, to consider other factors which influence the elasticity of demand for various farm products.

The first factor is the presence or absence of substitutes, since the demand for a product for which there are substitutes tends to be relatively elastic. This factor is particularly important in agriculture since many of the products of agriculture can be easily substituted one for the other in the consumer's budget. For example, in buying meat the housewife can choose between beef, mutton and pork, and in buying vegetables she has even a wider range of choice. If the price of one product within the group increases relatively to the prices of the others it is easy for the housewife to substitute one of the cheaper products and still maintain her total purchases. For example, a rise in the price of broccoli will almost certainly diminish their consumption and increase the consumption of some other vegetable such as cabbage or brussels sprouts. But the total demand for vegetables will be unchanged. In this way the demand for one of several substitutes may be more elastic because the others are available.

A second factor is the number of uses to which a product can be put, since demand tends to be more elastic for a product which has a variety of uses than for one which has a single use only. Milk is an important example of a product of British farms which can be put to many uses : it can be consumed liquid, it can be used with other food, it can be processed into butter or cheese, or it can be used in the form of casein as the raw material for manufactured articles. The total demand for milk is therefore a *composite demand*, and in considering the elasticity of the total demand, the different types of demand (corresponding to different types of buyers) have to be taken into account. Thus an inelastic demand on the part of liquid milk consumers might be offset by an elastic demand by the processors and the manufacturers.

Where producers have the necessary control of supply, as under monopoly or semi-monopoly conditions, the attempt is often made to isolate the different types of markets or uses of a product with multiple uses. For example the Milk Marketing Board maintained a different price structure for the liquid milk market and for the manufacturing market in order to exploit the different elasticity of demand in the two markets. It will be necessary to return later to a consideration of this kind of price discrimination.

A third factor influencing elasticity of demand is introduced in the case of farm products used as the raw material of manufacturing industry. Here the demand is a *derived demand*, that is to say it depends ultimately on the demand for the finished product in the production of which the raw material is utilized. Consequently the elasticity of demand for the raw material will be determined by the elasticity of the demand for the finished product. In so far as there is a tendency for an increasing proportion of the products of agriculture to undergo a measure of processing after leaving the farm, there is also a tendency for the demand to partake increasingly of the nature of derived demand.

Finally, demand is generally inelastic when the price of the product is very high or very low, while elasticity is greatest for commodities with moderate prices. Thus a small change in the price of a product which is generally cheap hardly affects the amounts purchased. On the other hand, the people who buy very expensive things will hardly take notice of small changes in their price. But things are expensive or cheap relatively to the purchasing power of consumers. It is, therefore, the relative value of products to different classes of buyers which affects the elasticity of demand in this connection. For example, the demand for products such as meat or vegetables or milk may be inelastic so far as the higher income groups are concerned, but elastic for the middle and lower classes.

The general idea of being able to measure the response of demand to different prices of a commodity is of the greatest practical interest. Its significance to producers is obvious when it is remembered that a big demand at low prices may yield greater profits than a smaller demand at higher prices. But, whether lower prices will lead to a bigger demand, or whether higher prices will diminish demand will depend upon the degree of demand elasticity for the product concerned. That is why it would be very much easier to formulate price policy if we could say with any degree of exactness what would happen to demand if we raised or lowered the price of a particular commodity. There is, unfortunately, little statistical evidence on this important aspect of economic activity, and this is a serious handicap to the formulation of price and production policies in agriculture. The few pioneer inquiries which have been carried out, however, have produced some evidence which gives interesting indications of the possibilities of this kind of economic research. But even if the amount of statistical evidence was very greatly increased, there would still remain the limitation that the evidence was based on past experience, and future experience does not necessarily comply with the past in all respects.

INFLUENCE OF DEMAND ON PRICES

In considering the influence of demand on prices, we are concerned with the proposition that changes in the demand for a product without compensating changes in its supply will cause changes in price. In other words it is necessary to consider the conditions of demand for farm products with special reference to the factors (other than prices) which bring about changes in demand. Much of the discussion is inevitably concerned with the complex of changing trends which together determine the total demand for food and for the other products of agriculture. All that can be done here is to enumerate very briefly the more important factors concerned.

(*a*) The number of consumers is obviously the first factor to be considered. Other things being equal, an increase or decrease in the number of the consuming population will result in corresponding changes in the total demand for agricultural products. Taking the greater part of the western world (and this country in particular) the era of rapidly expanding populations is giving way to a phase of stationary population which must sooner or later lead to an actual decrease in numbers. This means that the automatic expansion of markets through growing populations which has been hitherto a feature of commercial agriculture is coming to an end. It is inevitable that this change in the population trend must exert a profound influence on the demand for agricultural products, especially on the demand for staple foods.

(*b*) The consumption of food is conditioned to a considerable extent by the age-composition and by the nature of the occupations of the population. Both have undergone great changes during the present century. Thus the population is altering to include more elderly adults and fewer children, while the nature of occupations is altering in such a way as to reduce the amount of heavy manual labour and to increase the proportion engaged in sedentary occupations. These two changes have had a significant effect on the demand for food, since the very old and the very young require less food than those of full working age, while manual workers require more food than sedentary workers. Furthermore, the demand for food by these various classes differs not only in amount but also in kind. In particular, the amount of carbohydrates required by a population which is older and which has less heavy manual work to do has been reduced, but the demand for concentrated food has increased.

(*c*) Since it is the income of the individual which mainly decides the amount and kind of food consumed, some of the more significant changes in the demand for food are brought about by changes in the purchasing power of consumers. As a person becomes better off financially his diet changes and more expensive foods tend to take the place of cheaper. The familiar sequence is the shift from the staple cereals to more livestock products and, finally, to the increased consumption of fruit and vegetables. This trend is in keeping with *Engel's Law* which, among other things, states that the proportion of personal expenditure devoted to necessaries decreases as income rises, while the proportion spent on luxuries rises with incomes. The many studies of family budgets carried out in this country before 1939 corroborate this generalization so far as expenditure on different kinds of food is concerned. In one of the most ambitious of these studies an analysis of family budgets for six income groups showed the consumption of flour and potatoes to be remarkably uniform in all groups, cheese and fats reached their highest consumption in the middle groups and the consumption of most other foodstuffs rose with the income level.[1] There is also ample historical evidence that the increasing standard of living in this country has enabled the population not only to demand an adequate diet as regards bulk and energy value, but has also enabled increasing numbers to demand more and more meat, milk, butter, eggs, fruit and vegetables. Moreover, these high-priced foods are the very products in the production of which British farmers possess a real measure of comparative advantage.

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[1] J. B. Orr, *Food, Health and Income* (London 1936)

(*d*) Habits of consumption together with social fashions and conventions have an important influence on the demand for the food products of agriculture. The influence of religious and racial taboos on food consumption is well known. Consumption habits are also often based on local customs and prejudices. Some of these local habits may be associated with local conditions of supply as, for example, the marked demand of South Wales miners for Caerphilly cheese, or the Scots for porridge. Again, within localities and within income groups the greatest variations of consumption habits may be observed. A survey of milk consumption in different areas of England and Wales in 1938–39 brought out such variations.[1] At Crook, in Durham, milk consumption per head averaged about one-third of a pint per day, while at King's Lynn, where the price was the same and the average income per head very similar, the consumption of milk per head was 70 per cent higher. The variations between one household and another in the same town and even in the same income group were found to be still greater. Figures for Crook, for example, showed that households in the same income group differed in their expenditure on milk from ½d per head in some houses to 1/- per head in others. Such variations are not easy to explain on rational grounds. But changes in these habits and preferences may result in important and unpredictable changes in the conditions of demand for food. Such changes in habits may result from contact with other manners and standards either within or from outside a country, or they may result from general social changes in the country as a whole. In the latter connection the reduction in the size of families, the growth of the "week-end" habit and the development of mass feeding in canteens and restaurants have all exerted powerful influences on the demand for different types and qualities of foods in the present generation.

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[1] Murray and Rutherford, *Milk Consumption Habits* (Oxford 1941)

(*e*) In the main it is probably true that the demand for the food products of the farm is fairly evenly distributed throughout the year since the consumer's appetite and capacity for eating are fairly constant factors. Nevertheless, the time element in the demand for food is by no means unimportant in influencing food prices from season to season and even from day to day. For example, consumers in this country show a well-marked seasonal preference for pork ; the peak demand for milk each year occurs about the middle of July ; and so forth. Moreover, weather conditions, week-ends and holidays and such like factors all have significant influences on daily demand. The importance of such seasonal and daily fluctuations in demand on the prices of farm products is accentuated since rarely do they coincide with the natural seasonal fluctuations in farm production and output.

(*f*) Changes in the demand for farm products are often brought about by experimentation—by the discovery of substitute products or by the discovery of new uses for existing products.

Thus there has been a marked trend to substitute non-agricultural for agricultural products in many lines. So far this trend has been more in evidence for the non-food products of agriculture. As examples of this kind of substitution the replacement of the horse by the motor car and the manufacture of artificial wool and cotton may be mentioned. But the process is also influencing the demand for the food products of agriculture, especially significant being the substitution of synthetic foods for the so-called " natural foods."

The opposite trend towards finding new uses for staple agricultural products is also important, significant examples being the demand for cereals, potatoes and milk for the manufacture of plastics, industrial alcohol, starches, etc. If these developments become practical economic propositions the demand for farm products will be conditioned less by the needs of food-consuming customers and more by new industrial customers whose demand is for raw material for manufacture. This change in the *kind* of customer would exert important influences on both the regularity and the extent of the demand for many of the staple products of agriculture. Moreover, it would go far to neutralize any reduction in total demand which may follow the inroads of manufacturing industry in the production of the substitute products mentioned in the previous paragraph.

(*g*) Finally, conditions of demand for given agricultural products may be consciously stimulated either by producers themselves or by official action. Producers may be able to increase the demand and so influence the price of particular products by aggressive salesmanship and effective advertisement, or by the adoption of standardization aimed at increasing the attractiveness and convenience of the products to the consumers.

The process of " consumption steering " may also be used to implement official policy. In this connection nutritional programmes which aim at stimulating the consumption of " protective " foods are assuming increasing importance in their influence on the demand for the various food products of agriculture. For example, in this country state action in the form of consumer subsidies, educational campaigns and direct publicity, has been directed towards increasing the consumption and the demand for milk.

INFLUENCE OF PRICES ON SUPPLY

In considering the influence of prices on supply we are concerned with the *law of supply* which gives expression to the simple proposition that rising prices stimulate supply while falling prices tend to reduce it.

In the previous chapter it was stated that the fluctuation of general prices associated with the trade cycle are not accompanied in agriculture by corresponding fluctuations in output and in employment. On the contrary agriculture tends to use much the same amounts of the factors of production, especially land and labour, even when the general level of prices is falling. In consequence the level of total output in agriculture remains remarkably stable from year to year notwithstanding the fluctuations in the general price level.

It does not follow from this, however, that the supply of individual agricultural commodities is not sensitive to changes in individual commodity prices. On the contrary there is evidence that changes in relative prices *within agriculture* induce changes in supply reasonably efficiently. Changes in supply can be brought about in two ways: either they can result from increases or decreases in the output of existing producers, or they can result from an increase or a decrease in the numbers of producers. The hindrances to either method of altering supply are much less for individual farm products than for the total agricultural output. This is especially true in so far as changes in the *numbers* of producers are concerned, for a farmer remains a farmer even though he decides to become a producer of livestock commodities instead of a producer of cereals.

In more exact economic terms the difference between the two situations can be attributed to the greater mobility of the factors of production within agriculture than between agriculture and other industries.

In many cases if changes in prices warrant it, farmers can switch over from producing one commodity to another with little, if any, upset to their general organization. For example, the arable farmer can easily change his emphasis from wheat to barley, or the horticulturist from one salad crop to another, or the pig-keeper from producing baconers to producing porkers, and so forth. Shifts in production in response to price are not so lightly made, however, if they require new capital equipment or the costly adaptation of existing equipment.

Another factor which has an influence on the response of farmers to changes in the relative prices of farm commodities is the time element involved in switching from one line of production to another. There are two considerations here. The first is that a long period required to make the change may be a deterrent to making the change at all. The second is that after a change has actually been made it may still take a long time for it to become effective in adding to or decreasing supplies. This is why the response to changes in the prices of annual crops is probably different to the response to changes in the prices of perennial crops. Again the response to changes in the prices of crops generally is probably greater than the response to changes in livestock prices, since livestock (especially cattle) take longer to reach the productive stage. For similar reasons the change from pasture to tillage may occur more rapidly than the change from tillage to pasture.

The reorientation of British agriculture between 1875 and the turn of the century, and the many changes in the character of the agricultural output which have taken place since then provide evidence of the response of agriculturists to the changes in the prices of the commodities they produce. The case of wheat and milk may be quoted as important illustrations of the general situation. Thus the drop of approximately 50 per cent in the price of wheat which occurred between 1873 and 1896 led in Great Britain to a decrease in the wheat area from 3·5 million acres to 1·7 million acres during the same period. On the other hand, British farmers responded to the improvement in wheat prices which followed the passing of the Wheat Act of 1932 by increasing the acreage of wheat by over 40 per cent in a period of three years.[1]

The development of milk production provides an equally impressive illustration of the general response of farmers to the price incentive, though here the opening up of facilities for the handling of liquid milk has also been an important factor. Established milk-producers have increased their output and thousands of new producers (from the ranks of farmers who previously produced no milk) have added to the increasing supply. The best available measure of the increase in milk production is provided by the annual June statistics of the numbers of cows and heifers in milk or in calf. Between 1866 (the first year for which statistics are available) and 1940 the number of dairy cows in England and Wales increased by 101 per cent. In the 40 years up to 1914 the increase was approximately 34 per cent, and in the 25 years up to 1940 it was 31 per cent. Not only has the price incentive induced farmers to increase the total milk supply, but it has also induced a remarkable change in the seasonality of production. Thus the increase in winter as compared with summer milk prices has induced farmers to plan the date of calvings so as to secure a much higher proportion of winter milk.

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[1] The experience of the periods of the two world wars is not entirely relevant, for the price incentive was not then the only or the most important means of inducing changes in production and supply.

The history of British agriculture also supplies evidence that, in the case of several commodities, many farmers respond to changes in prices in the short-period as well as in the long-period. Indeed, for a few commodities, the quickness of the response has resulted in familiar cyclical trends notably for pigs and for potatoes. Thus it has been shown that in certain periods in this country a rise of 10 per cent in pig prices increased pig numbers 21 months later by about 6 per cent. Similarly, before the advent of the Potato Marketing Board in 1933, a fall or rise in potato prices was followed immediately by a substantial change in the acreage planted to potatoes. The same tendency has been discernible in the supply of some other commodities; e.g. the acreage of many horticultural crops jumps about almost simultaneously with changes in prices; a rise in wheat prices is reflected in the acreage planted in the next season and the effect is discernible a year later; low sheep prices result in diminished sheep flocks some three or four years later; changes in the price of fat cattle show their effect on supplies some eight or nine years later.

There is evidence that in the case of some of these commodities the farmer's response to current prices often results in an overshooting of the market requirements. The resulting surplus supply then becomes a major factor in causing prices to fall. Indeed prices and supplies are mutual in their influence, and it is not easy to distinguish between what is cause and what is effect. But whether expanding and contracting production be regarded as cause or effect it is certain that the accompanying cycle of falling and rising prices carries " in its train many costly miscalculations and avoidable losses." [1]

In spite of these examples of the sensitive reaction of supply to price it would be wrong, nevertheless, to give the impression that farmers generally react rapidly and automatically to changes in the prices of the commodities they produce. On the contrary there are several factors which retard the operation of the self-adjusting mechanism of prices as the guide to production in agriculture. Furthermore, there are also factors which often nullify the gain which farmers who respond expect to achieve at the time when the response is made. Some of the more important of these factors must now be mentioned.

First, the lack of price-sensitivity on the part of farmers, and especially the rank and file of family farmers, noted in the previous chapter, is also not without its influence on the elasticity of supply of individual farm commodities. Thus the response of many farmers to outside stimulus, be it price or what not, is always tempered by this general inertia derived from technical conservatism, the force of custom and attachment to long-established programmes of production. It should be pointed out, however, that this general inertia is not entirely conservatism in any bad sense, but it arises from a sense of continuity and possibly from a feeling that price changes in the long run correct themselves so that the individual producer can drive through the heights and the hollows over a considerable period, averaging out his gains and losses to a successful end.

Secondly, it has to be recognized that farmers have a difficult task in assessing beforehand the financial advantages of any changes in the tempo or content of their production programmes. The difficulty has a two-fold aspect. In the first place a decision to change the scale of production of any commodity already being produced on a farm must depend not only on the price of the commodity but also on its costs

[1] *Report of the Committee on Stabilisation of Agricultural Prices* (Ministry of Agriculture and Fisheries Economic Series, No. 2, 1925), p. 22

of production. Here the complications resulting from the early advent in farming of conditions of increasing costs (or of diminishing returns) is a serious factor. But the greater difficulty arises from the complementary and supplementary character of most farm production. This means that the farmer is concerned with the comparative prices of the several commodities which he produces. Moreover, he has to consider the effect of increasing or decreasing the scale of any one commodity on the financial results for *the farm as a whole.* For example, a drop in the price of sheep might indicate a reduction in the size of the sheep flock, but this might affect the fertility of land wanted to grow barley, and barley prices may have risen. In other words opportunity costs play such a significant part in most farming systems that the issue posed by a change in the price of any one product confronts the farmer with a problem in management which is by no means simple and straightforward.

Thirdly, in general the farmer's response is to current prices, whereas it is future prices that are of critical relevance to changes in the plan of production on the farm. As will be seen in the next section changes in the prices of farm products are often due to passing causes which have little bearing on future trends. It is not easy for the mass of farmers to distinguish between those changes in prices which are fleeting and those which are significant for the future. But the substantial time lag in agriculture between the decision to alter production and the actual appearance of the changed supplies on the market makes it very dangerous to assume that current prices are reliable indicators of future prices even twelve months ahead.

Finally, the response of the farmer to changes in price can only affect the output he intends to produce. It does not, by any means, decide the change in supply which may result from the change in the farmer's production programme. Here, again, it is the dependence of all farm production on the hazards of nature that is the final arbiter. For instance, a farmer's decision to increase his output of a particular crop in response to a rise in its price is manifested in an increase in the acreage sown to that crop ; the quantity of the crop finally harvested is largely outside the control of the farmer. There is less risk of disparity between projected and actual outputs in the case of livestock, though here also the final supply is by no means completely determined by the farmer's intentions.

What has been said above throws some light on the apparent paradox of a relatively stable agriculture existing side by side with a relatively elastic supply of individual farm products. But the paradox is capable of another reconciliation more consistent with the economic theory of marginal supply.

Agriculture can be conceived as consisting of a central block of farmers (perhaps the majority of producers of certain products) following a consistent policy relatively little affected by prices. This central block is surrounded by a fringe of producers who may be described as in-and-out producers. Both the central block and the fringe are of two kinds.

Some of the central block of farmers are merely conservative. But others may be among the very best and most progressive farmers both in the technical and in the economic sense. Now these efficient farmers may be consistent farmers because their costs of production are low, and therefore they are well within the margin in all normal shifts of prices. Their costs may be low either because they are on good land, favourably situated to markets, or because they are technically and managerially efficient.

The fringe of in-and-out producers are also of two kinds. Some may be good farmers who are farming land which becomes quickly sub-marginal for some particular purpose when there is a drop in price. But many are marginal farmers whose skill is not equal to making things pay except when prices are exceptionally favourable, but who, nevertheless, show a remarkable tenacity in clinging to their farms through good and bad times. In theory, the marginal farms are the farms which should be in and out of production of certain commodities as a quick response to price conditions. A quick response to price conditions implies, however, extremely capable knowledge of farming conditions and of the technical and managerial business of farming. But we do not find in practice that it is the efficient farmers who are usually farming the marginal land. Indeed, there is some evidence that marginal farmers tend to gravitate towards marginal farms.[1] If it were otherwise we should get a much quicker response to the shifts in prices.

INFLUENCE OF SUPPLY ON PRICES

In dealing with the influence of supply on prices it may be well to consider at the outset the theory which attempts to explain prices solely in terms of supply. According to this theory the price of a commodity is governed by the costs of producing the marginal units of it.

The theory rests on the influence of competition between producers. When the price of a commodity is much above its cost of production, the profits made by the producers will induce more to be produced and sold. The resulting increase in production and in supply will, in turn, tend to bring down prices. As prices drop, producers will tend to produce less and some producers may go out of production. If the price falls below its cost of production the commodity will cease to be produced for it will not pay anyone to go on producing it. In this way so long as there is a demand for the commodity, producers will compete with each other in producing the necessary supply and will thus tend to keep the price oscillating somewhere near to its cost of production.

It is not enough, however, to state that the price of a commodity is governed by its cost of production, for most commodities (and especially agricultural commodities) are produced by large numbers of producers whose costs of production may vary very considerably. Hence the refinement that the price is governed by the cost of producing the marginal unit required. Once again the concept of the margin becomes important. In this connection the marginal cost is the cost incurred by the marginal producer. The marginal producer is the producer who is producing under the least advantageous conditions but whose output is necessary if the effective demand is to be met. The concept is best explained by a simple hypothetical illustration.

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[1] An examination of the relation between grade of occupier and general conditions of holdings in one county in 1941 showed that 93 per cent of the "best" holdings were occupied by "A" farmers, while there were no "A" farmers on the "worst" holdings. (*National Farm Survey of England and Wales*, p. 70)

Suppose the supply of wheat for a particular market can only be produced by four farmers A, B, C and D whose costs of production are 30/-, 35/-, 40/- and 45/- per quarter respectively. If at any time the effective demand for wheat can be supplied by the outputs of farmers A, B and C then the price of wheat will be just over 40/- per quarter. That is, the price of wheat must be sufficient to induce farmer C to produce, thereby ensuring the necessary supply to meet the demand. But if the total demand cannot be met by the combined outputs of these three farmers and it becomes necessary to have wheat from farmer D also, then the price must increase to just over 45/- a quarter in order to induce farmer D to produce. In the first situation it is farmer C who is producing the marginal unit, and in the second situation it is farmer D. In both situations it is the cost of producing the marginal units which is the operative factor governing the price of wheat in the particular market.

The theory that prices are governed by costs of production is one which has a naturally strong appeal to farmers and to producers generally. Thus it is often claimed that producers are entitled to receive a price based upon their cost of production. But from the economic standpoint this is only justified provided the output of the producers concerned is needed to meet the demand of consumers. In the sense that prices must cover costs if production is to continue, the theory is of course almost axiomatic, but only for those producers whose production in total is required. But it does not follow that the link between costs and prices is so well-defined as this simple proposition suggests. On the contrary, the relation between the two is a highly complicated one.

Moreover, the concept of cost of production is itself by no means as simple as it seems. This is especially true in agriculture. There are many reasons for this, of which three are of particular importance.

The first has already been taken into account. It is the great range in cost figures that is invariably revealed by careful methods of accounting. A good illustration of this range in costs is given in a study of variations in the costs of producing milk in this country in the five years from 1934 to 1939.[1] In each of these years the range in costs on individual farms was from 4d per gallon at one end of the scale to 20d per gallon at the other end—a range of 500 per cent. However, the number of farms at either end was not great, and rather more than three-quarters of the costs ranged from 7d to 12d per gallon in each year, a range of 5d per gallon. Most cost studies carried out in this country reveal similarly wide ranges both for livestock and for crop products.

Secondly, the computation of the costs of producing most farm products entails a very high degree of estimation, since many of the cost items cannot be assessed with precision. At least four different categories of estimates have generally to be made : (*a*) an estimate of the proportion of general farm overheads such as rent and establishment costs to be charged to the particular commodity concerned ; (*b*) an estimate of the value of non-commercial items of costs especially family labour ; (*c*) an estimate of the value conferred by one enterprise which has a supplementary relationship to another, e.g. the beneficial effect of one crop in a rotation on succeeding crops, or the benefits resulting from the interdependence of crops and livestock in mixed farming systems ; (*d*) an estimate of the value of raw materials produced on the farm and used on the same farm to produce sale products, e.g. roots or hay for livestock ; this becomes still more complicated when the by-product from a sale-product is used on the same farm to produce a second sale-product, e.g. dung used to grow crops, or sugar-beet tops used to produce milk.

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[1] See A. Bridges, *Milk Production* (Oxford 1943), p 12

Thirdly, and most difficult of all, is the almost unsurmountable task of ascertaining the costs of joint-products. The problem of joint-product costs arises when one commodity cannot be produced without the other. Farming provides most of the familiar classical examples of this joint-product relationship, e.g. milk and calves, mutton and wool, grain and straw, poultry and eggs, etc. The difficulty of ascertaining the costs of each of the joint-products has its counterpart in the equally difficult if not impossible task of establishing any link between the separate costs and the separate prices obtained for the two products on sale.

This brief discussion of the relation between prices and costs may well be concluded by referring to a statement made in Chapter VI in dealing with the relation of costs to output.[1] The statement was that the complementary and supplementary character of many farm enterprises may justify farmers in producing some commodities even though it may be shown that, on a strict accountancy basis, their costs of production are not covered by the prices obtained. It is important to keep this in mind in any discussion of the influence of supply on prices in agriculture.

Finally, it may be well to emphasize, once more, that all production is for consumption. The weakness of the cost-of-production theory of value is its sole emphasis on supply. Farmers are all too prone to the view that consumers have a duty to buy whatever is produced on farms at prices which cover production costs. But in an exchange economy no product has a price, if there is no demand for it. In the absence of demand it would not matter how much is produced or what it costs to produce. For example, if people stop eating cabbages there is no market and therefore no price for cabbages whether it costs a penny or a shilling to produce one cabbage.

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[1] See pp. 122–3

Although the attempt to explain prices solely in terms of costs of production must be considered inadequate, it is true, nevertheless, that fluctuations in supplies constitute the most important single factor responsible for the comparatively violent fluctuations which characterize the prices of most agricultural commodities. This was the conclusion arrived at in the *Report of the Committee on the Stabilisation of Agricultural Prices*[1] which enumerated four main reasons for the fluctuations which are such a prominent feature of the supply of most agricultural products. These four reasons are (*a*) variations in yield due to seasonal and weather conditions, (*b*) variations due to supplies being more abundant in certain months of the year, (*c*) variations due to the deliberate action of producers, and (*d*) variations arising out of conditions of marketing. The first two causes are almost entirely outside the control of producers, while the third and fourth are mainly the result of the conscious action or inaction of the producers themselves.

The " uncontrollable " causes of variations in the volume of supply are the direct outcome of the biological character of agricultural production. The most important of these causes is undoubtedly the weather, but the ravages of insects and pests and outbreaks of disease are also of great significance. In general these factors exert a greater influence on crop products than on livestock products. Table XII illustrates the variations in average yields for some of the important crops in England and Wales during the nineteen-thirties. These average figures mask variations which are probably greater still for different districts of the country, while on single farms the variations often range from complete failures to bumper harvests.

All the crops listed in the table exhibit ranges in yield which must have had a major effect on the total volume of production apart from any changes in acreages planted. Indeed, the physical gamble of production in the case of some of these products is notorious and hardly needs elaboration.

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[1] Ministry of Agriculture and Fisheries Economic Series, No. 2, 1925

Table XII—Highest and Lowest Average Yields of various Crops in England and Wales, 1929–38 *

Crop	Highest Yield	Year	Lowest Yield	Year
Wheat, cwt. per acre . .	20 3	1938	15·9	1930
Barley, cwt. per acre . .	18·1	1938	14·0	1937
Oats, cwt. per acre . .	16 4	1929, '33, '38	15·0	1931
Beans, cwt. per acre . .	17·2	1930, '34, '37	13·9	1935
Sugar-beet, tons per acre.	10·2	1934	6·6	1938
Potatoes, tons per acre .	7·3	1938	5·5	1931
Hay, cwt. per acre . .	22·3	1931	14·8	1938
Onions, tons per acre .	6·7	1937	5·5	1935, '38
Carrots, tons per acre. .	14·3	1936	8·4	1933
Strawberries, cwt. per acre	29·1	1931	9·2	1935
Raspberries, cwt. per acre	29·2	1937	6·9	1935
Black currants, cwt. per acre	20·8	1934	12·5	1938
Gooseberries, cwt. per acre	46·1	1930	22·6	1938
Apples, lb. per tree . .	72·5	1934	12·7	1935
Plums, lb. per tree . .	66·1	1934	8·0	1935
Pears, lb. per tree . . .	35·2	1936	11·6	1938
Cherries, lb. per tree . .	61·2	1930	15·4	1938

* Extracted from *Agricultural Statistics 1939*

The alternations between prolific seasons and seasons of light crops have their counterpart in abundance and scarcity of supplies. These erratic supplies, in turn, are reflected in erratic prices. It is a matter of common observation that bumper crops usually sell at low prices and light crops at high prices. This inverse relation of yields and prices is accentuated still further for those commodities having the relatively more static demand. An important illustration is afforded in the case of potatoes—a crop having erratic yields and erratic supplies, but the demand for which is relatively stable. But the closest inverse correlation between yields and prices is discernible for those crops, such as fruit and vegetables, which are either very bulky or highly perishable, and for which the market is consequently narrow both in time and space. A striking illustration of this is afforded by the following index numbers of the average yields and the average prices of plums in the three years 1937, 1938 and 1939 :

Year	Index of Yield	Index of Price
1937	100·0	100·0
1938	30·9	203·0
1939	114·5	116·9

Given such conditions it is understandable that a " good year " as regards yields may mean losses and even disaster to producers. On the other hand, poor yields mean short supply and handsome profits to those who have enough of the commodity to sell ; but there is no equivalent gain to those whose yields have been so poor that they have not enough to sell to get any real advantage from the high prices.

Few, if any, manufacturing industries have to contend with disconcerting paradoxes such as these, and it is little wonder that the farmer should regard the " weather-bound " character of his production as the dominant factor in his economic life.

The second " uncontrollable " cause of the variability of supplies is to be found in the seasonality of most agricultural production. In the case of all crops harvest time is production time in the sense that the total output of a crop becomes available within a comparatively short period of a few weeks or even days. This output which in its finished form is compressed into a short period of the year is designed to meet a demand which is more diffuse in time. If, therefore, the available output is immediately put on the market (which in economic terms means being translated into effective supply), it is not difficult to see that the market may easily be glutted with a consequent depressing effect on prices. This is almost inevitable, however, in the case of highly perishable crops, especially fruit and vegetables. The case of strawberries may be quoted as an example of the kind of situation which obtains. The strawberry crop is all picked and sold in about a month.

The season opens with relatively high prices, but as supplies become plentiful after the first few days, a sharp break occurs, and, thereafter, relatively low prices are the rule with the possibility of some improvement towards the end of the season. This well-established seasonal trend is illustrated by the following average weekly prices realized by a group of 142 Hampshire growers in 1931.[1]

Week ending	Pence per lb.
6 June	28·7
13 June	15·8
20 June	9·5
27 June	4·9
4 July	3·5
11 July	2·8
18 July	3·5

Growers of products of this kind do of course expect to take the short season as being part of the job of growing such products. But weather conditions within the season may cause unpredictable fluctuations of supplies and prices. Thus "a few hours sunshine in April will increase the quantity of Cornish broccoli ready to cut by as much as 25 per cent. . . . When it is realized that a difference of 10 per cent in the daily supplies of perishables at a wholesale market may turn a relative scarcity into a glut, it will be appreciated how sudden and drastic may be the effect on prices of daily variations in supply throughout an otherwise normal season."[2]

An analogous seasonal trend obtains for livestock production, although it is possible for the producer to take more effective steps to overcome seasonality of output with livestock than with crops. But many illustrations can be given of the influence of seasonal production causing fluctuations in prices of livestock and of livestock products. Thus "the prices of fat sheep and lambs in England and Wales fluctuate from month to month, more or less regularly, year after year. The price changes are mainly due to the fluctuations in the number of sheep and lambs arriving on the market . . . receipts are greatest from June until October, and are below average from November until May. The price moves inversely to the receipts, so that prices tend to be above the annual average from January until May, and then low from June until December. Prices swing from 9 per cent above the average annual price in April to about 7 or 8 per cent below the average in October."[1] The case of milk is also very familiar, the summer flush of milk being reflected in much lower prices than are obtained for milk produced in winter, the period of "natural" short supply. Equally well known is the inverse relation of seasonal prices and seasonal output in the case of eggs—"egg-production in this country is at its highest from February to June and reaches its lowest point in November. Prices, on the other hand, are at their lowest in spring and summer and reach their maximum in November."[2]

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[1] Thomas and Bisset, *The Strawberry Industry of South Hampshire* (Cambridge 1933), p. 62

[2] *Interim Report on Fruit and Vegetables* (Departmental Committee on the Distribution and Prices of Agricultural Produce, Cmd. 1892, 1925), p. 25

It is not quite correct to speak of the above factors as uncontrollable, for in fact there is something which producers can do about both. The least tractable is variable crop yields, though skill in cultivation is not without its effect even here. But the real remedy for fluctuating crop yields lies in the hands of the scientist, and involves the breeding of improved and new varieties of plants and the discovery of still more effective measures to prevent and to combat the attacks of pests and disease. Variation of output due to the seasonality of production is much more amenable to action by the producers themselves. Thus systems of livestock management are being increasingly designed to spread production more evenly throughout the year. Notable in this connection are systems of herd and of flock management which, by timing the mating of animals and birds, are overcoming the problem of the compression of output within the " natural " seasonal trends.

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[1] K. A. H. Murray, *Factors Affecting the Prices of Livestock in Great Britain* (Oxford 1931), p. 107

[2] *Report on Egg Marketing in England and Wales* (Ministry of Agriculture and Fisheries Economic Series, No. 10, 1926), p. 14

The third cause of variations in supply arises from the conditions of marketing Here we are concerned with the problems of preventing a variable output being translated immediately into a corresponding variable supply. There are two possible methods of control open to the producer.

The first is to store his surplus stocks and release them on to the market in an orderly way according to demand. The relative perishability of many farm products sets very definite limits to the efficacy of this method. For example, bumper crops of most fruit and vegetables must be disposed of immediately. Even wheat, one of the least perishable of farm products, can seldom be stored for more than two seasons. Moreover, the producer himself generally lacks the necessary facilities for storage. That is why storage is generally undertaken after the produce leaves the farm. Where efficiently controlled, storage does help to avoid the glutting of the market in bumper seasons, and thereby helps to eliminate the more extreme fluctuations of prices. If several bumper seasons follow each other, however, a policy of storage may increase the embarrassment of producers since stored produce must ultimately come on the market. Such a position of embarrassment confronted the Wheat Pools in North America during the nineteen-thirties.

The second method differs in that it attempts to prevent the surplus produce from ever reaching the market. This may be done by finding alternative uses for the product during seasons of heavy supplies For example, when the price is very low and the crop very heavy the farmer can divert some of his sale crops to livestock feed, or he may even be justified in ploughing them back into the land for fertility. In extreme cases the crops, or part of them, may be allowed to waste as, for example, when prices are not high enough to cover the costs of picking or harvesting.

But the most serious aspect of variations of supplies arising from the methods of marketing is the ignorance of the mass of producers about market conditions and about the reactions of their fellow producers. The discussion of this aspect is, however, more concerned with marketing than with prices, and is therefore postponed to the next chapter. All that need be said here is that unorganized methods of marketing often accentuate the fluctuations in prices which are more or less the inevitable result of variable yields and seasonal output.

Finally, it is necessary to mention two other factors which have had an important bearing on the supply, and hence on the prices, of agricultural products during the present century. The first is the tendency for the total supply of many staple farm products to show a continuous increase in advance of demand. This is partly due to the extension of the effective farming area of the world, and partly due to the increasing application of the findings of science to farming practice. The result has been to render the staple farm products relatively plentiful and, therefore, relatively cheap. A notable example of this is provided by the opening up of vast new wheat lands : first of all transport was the powerful agent at work ; then came the introduction of hybrid seed making crops more acceptable to certain regions ; then, finally, the mechanization of production and harvesting made it possible to handle large areas of land expeditiously and economically. Since certain capital developments were necessary for the expansion of the new areas, the expansion was at times accelerated by short periods of comparatively high prices which enabled this capital to be spent. When prices dropped again, the new areas were in a position to compete effectively with the old areas, since their operating costs were as low as, if not lower than, those of the old areas. Some authorities have suggested that, before 1939, this development led to a situation of endemic over-supply for many of the staple products of farming, and this over-supply exerted a continuously depressing influence on farm prices and on farm incomes.

So far as this country is concerned no discussion of the influence of supply on prices would be complete without some mention of the influence of imports. Before 1939, the volume of imports was a major factor in determining the prices of those farm products which were important in world trade. Many of the proposals put forward for the stabilizing of farm prices in this country were prompted by this situation. The more important of these proposals are described in the final chapter of this book.

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CHAPTER XI

AGRICULTURAL MARKETING

WHILE prices decide the mechanism whereby the movement of products through the channels of trade is guided, the actual job of bridging the gap between producers and consumers is carried out by the system of marketing. As was pointed out in the first chapter of this book, under present-day conditions the consumer's needs are not satisfied by producing food on farms ; that food must be taken to the consumer in the quantity and in the form he wants, when and where he wants. These are the functions performed by the agricultural marketing system.

MARKETING SYSTEMS

The systems of marketing farm products are very complex, farm products being sold by a number of different methods and by a large number of different kinds of agents and agencies.

The simplest system occurs when the farmer sells his produce direct to the consumer. In the main this system is now restricted to those farm products (such as milk, eggs and poultry, fruit and vegetables) which can be consumed with little or no processing after they leave the farm. It is also restricted, though not exclusively, to the produce of those farms which are situated virtually on the consumer's doorstep, that is to farms in the immediate vicinity of towns and villages.

The more usual form of this system is for the producers to establish a retail round, as in the case of milk or eggs, for direct sales from house to house. But the producer may also take a stall in the local market, or he may have a shop in the neighbouring town at which consumers make their purchases. Where it is practicable the method of direct sale probably secures the best possible return to the producer-retailer (the term usually applied to farmers who practise the method on any considerable scale), while the consumer obtains a supply of reliable produce at fair prices. The objection to it from the producer's side is that it tends to interfere with his primary occupation of producing. Indeed, as the term producer-retailer suggests, the farmer concerned may often be only a part-time farmer since the proper supervision of the retail round is itself a separate occupation. From the consumer's side a possible objection to this method of direct sale is that the quantity and quality of the supply is dependent upon a single farmer's ability to maintain production of the things the consumer requires.

It is not possible to give any near estimate of the extent of this system of direct marketing, but the Milk Marketing Board estimate that some 40 per cent of the total number of farmers registered for the sale of milk in England and Wales undertake some measure of producer-retailing and distribute altogether about 16 per cent of the country's milk. The majority of producer-retailers are, however, to be found in the ranks of the smaller farmers, and it is true to say that the quantity of agricultural produce sold direct by farmers to consumers forms only a small proportion of the total supply.

At the present time, while the farmer usually remains his own salesman, the bulk of his produce is actually marketed through a distributive machinery which is mainly in the hands of non-agricultural specialists. These specialists are generally called distributors. It is their job to perform the essential services which span the distance and time between farmers and consumers under modern conditions of commercial agriculture. Distributors, in turn, have found it necessary to specialize still further by concentrating on particular stages of the distributive process. Indeed, the specialization of function within the distributive machine has proceeded so far that a realistic study of agricultural marketing involves a separate study of each of the products which the farmer sells. Many such studies have been carried out in this country since 1924 when the Departmental Committee on Distribution and

Prices of Agricultural Produce[1] reported fully upon methods of distribution of agricultural products. All that can be attempted here is to indicate briefly the principal intermediaries handling some of the major groups of farm products in their journey from the farmer to the consumer or to the manufacturer.

Milk

After the establishment of the Milk Marketing Board in 1933 all milk was sold under contract prescribed by the Board. But in its journey from the farm to the housewife liquid milk was still handled by as many as four different intermediaries. Thus it passed along any one of the following channels : (1) producer to consumer ; (2) producer to retail dairyman to consumer ; (3) producer to wholesaler to retailer to consumer ; or (4) producer to first wholesaler to second wholesaler to retailer to consumer.

During the Second World War the Milk Marketing Board became the direct purchaser of milk sold by farmers except that sold by producer-retailers. The Board then sold the milk to the Ministry of Food, which determined how much should be used for the manufacture of dairy products and how much should be reserved for liquid consumption. The milk was then resold by the Ministry to the distributors and manufacturers. The Ministry of Food also took steps to bring about the rationalization of milk collection and distribution. First, it rationalized the collection of milk from the farm and its transport to the first-hand buyers, and it controlled the destination of the milk when moved from the depots. Secondly it rationalized retail distribution by eliminating the overlapping of delivery routes. In urban areas of 10,000 or more inhabitants, associations of dairymen were formed, and the delivery in each area was divided between the dairymen so that each served a compact block of streets. This replaced the peace-time conditions when one street might be served by six or more roundsmen representing the few large companies and the immense number of small retailers and producer-retailers who were concerned with the retail distribution of milk.

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[1] This Committee is popularly known as *The Linlithgow Committee* after its Chairman the Marquess of Linlithgow

Livestock

Before 1939 the three channels of sale for fat livestock were : (1) sale on the farm or in the market to the local butcher or dealer ; (2) sale by auction in a local market ; and (3) sale by consignment to a wholesale meat market. Some four-fifths of total sales were made through local auctions, selling " by the eye " being the rule and selling by weight the exception. Dealers buying direct from farmers or from the local auctions sold the livestock in turn to the butchers, or consigned them to the larger urban markets to be sold to the wholesale carcase butchers. In this way fat stock might pass through the hands of one, two, three or four intermediaries before slaughter.

In 1940 these methods of selling fat stock by farmers were completely altered to enable the war-time system of meat rationing to operate efficiently. The Government became the sole purchaser of all livestock sold for slaughter. Farmers were no longer free to choose between selling privately to a butcher or dealer, or selling through a public auction market. All fat cattle, sheep and pigs had to be sold to the Ministry of Food at specified collecting centres to which the farmers were tied. Cattle and sheep were graded at these centres and then slaughtered on the Ministry's behalf in selected slaughter-houses. Pigs had either to be delivered to the collecting centres or sent straight to a bacon factory on the direction of the Ministry.

Although, as already stated, this war-time system was conceived in the interests of meat rationing as such, it did, nevertheless, incorporate three features generally assumed to be necessary to the improvement of the marketing organization for fat livestock in this country. First, it substituted sale by weight for sale " by the eye," especially for cattle. Secondly, it attempted to concentrate the through-put of slaughter-houses:

before 1939 there were 16,000 slaughter-houses in England and Wales alone, by 1944 there were only 750 slaughter-houses retained in operation by the Ministry of Food. Thirdly, by directing supplies from the farm to specified centres and slaughter-houses it eliminated much of the cross-transport which previously existed, when it was by no means uncommon for fat cattle to be moved from Cornwall to Aberdeen, from Devonshire to Birmingham or from the north-east of England to Scotland.

Cereals

In contrast to the elaborate structure of the great wheat-producing countries, the sale of grain in this country has been a fairly straightforward transaction. Before 1939 most grain was sold by sample to a merchant or dealer and there was rarely more than one intermediary between the farmer and the miller or maltster. Since 1939 all grain sold by farmers has had to be sold only to an approved buyer. Grower-to-grower sales of seed grain have been permitted under licence, but other inter-farm sales of grain have not normally been allowed.

Poultry and Eggs

The distinctive feature of the sale of poultry and eggs in this country in the past has been the important part played by the local " higgler " or country dealer. These collectors called at farms once or twice a week to buy the eggs for cash for resale to other middlemen. A substantial proportion of the eggs marketed, however, were sold by the producers direct to consumers or to retailers. During the nineteen-thirties egg-packing stations began to play an increasingly important role. But in the marketing of eggs some or all of the following agencies continued to handle the produce—higglers, local auctioneers, dealers, commission salesmen, wholesalers, packing stations and retailers.

The requirements of war-time rationing necessitated a complete break with these traditional methods of selling poultry and eggs. Producers with more than 50 birds were compelled to sell their eggs only to packing stations or licensed buyers with whom they were registered. Packing stations could sell only to the Ministry of Food acting through their agents, the National Egg Distributors' Association Limited. This organization in turn allocated the eggs to registered wholesalers from whom the retailers received their supplies in proportion to the number of their registered customers.

Fruit and Vegetables

The Linlithgow Committee stated that " the fruit and vegetable industry is unique in the number and variety of intermediaries who may, at times, be engaged in handling the produce and whose sole service is distribution." This was especially true of the fruit and vegetables raised in the specialist producing areas since a substantial part of this produce was first consigned to the big central London markets from where it was re-consigned to the provinces. According to the Linlithgow Report 6 per cent of the fruit grown in these specialist areas passed through the hands of five intermediaries, 20 per cent through four intermediaries, 30 per cent through three intermediaries, and 39 per cent through two intermediaries. Only 4 per cent passed through the hands of one intermediary only, while the proportion sold direct to consumers was negligible.

During the war the marketing of fresh fruit and vegetables also came under the jurisdiction of the Ministry of Food. Wholesalers, selling agents and buying agents were licensed and the wholesale channels through which produce might be marketed were prescribed by order. But the experience of the war-time control of vegetable marketing (especially the episode of the short-lived National Vegetable Marketing Co., formed in 1941 under the auspices of the Ministry of Food) emphasized the extraordinary difficulties connected with any attempt to rationalize the distribution of commodities which are both highly perishable and subject to wide fluctuations of supply.

It is obvious from the above brief descriptions that in the past marketing organization in agriculture has had no very definite structure. Nevertheless, it is possible to differentiate between certain more or less broad classes of distributors who find it profitable to concentrate on one or other of the three main stages into which the distribution process divides itself. The first stage involves buying from the farmer, the second is concerned with wholesale collection and distribution and the third stage with retail distribution. The first and last stages are performed by a few large and by a great number of small distributors, while the intermediate stage is mainly in the hands of distributors who are usually organized on a big scale.

In the narrower sense these various classes of intermediaries are all concerned with the job of buying and selling. Selling has as its aim the disposal of the produce at the most profitable price. It requires detailed knowledge of markets, and the fullest information about existing and prospective conditions of demand and supply. This is why farmers have left the marketing of their produce to specialists whose duty it is to know the goods they are handling, and the different markets in which they can be disposed. These specialists may be either persons operating independently on a profit-making basis, or salaried specialists employed by producers' co-operatives or by state agencies.

MARKETING SERVICES

The marketing of agricultural produce involves many services besides selling and distribution. As stated earlier, marketing is the process of making the products which the farmer produces on his farm available to the ultimate consumer in the form and quantity he requires them, and when and where he requires them. Put in more theoretical terms it is the function of the marketing system to give *form utility*, *time utility* and *place utility* to the goods which farmers produce. In the creation of these utilities as many as seven different services may have to be performed, depending on the nature of the product concerned and on the conditions under which it is produced and marketed. It is usual to designate these services by the following terms: (1) assembling; (2) grading and standardization; (3) packaging; (4) processing; (5) storing; (6) transporting; and (7) financing and risk-bearing.

Assembling

Assembling is the first service, and its purpose is to collect the outputs of numerous producers into the optimum bulk necessary for the effective conduct of subsequent marketing operations. The importance of assembling as a means of facilitating the orderly feeding of markets is fairly obvious where those markets are far away from the multitude of small producers responsible for supplying them. But even in this country, where producers are relatively near to their markets, there are advantages in assembling in bulk the small outputs of farmers in the vicinity of production before undertaking the transport to the consuming centres.

Grading and Standardization

Grading is the process of sorting commodities into lots of uniform kind, size or quality, and standardization is the process of establishing the permanence of the grades by ensuring that the same specifications are used each time grading is performed.

The commercial advantages of standardization are well known. They depend on the assumptions that standardization (1) reduces costs throughout the market by eliminating the handling of worthless produce at the earliest possible stage; (2) protects the price of the superior article from the depressing influence of the inferior article; (3) makes possible sale by description; (4) widens the market by making advertisement possible and by the good reputation created by the sale of quality goods.

For most manufactured commodities standardization has become very largely an integral part of production itself. It is very different in agriculture, for it is almost impossible to standardize farm commodities while in process of being produced. This is not to say that the farmer cannot direct the organization of his farm towards the growing of standard products. On the contrary, the use of the right strains and breeds of plants and animals coupled with the necessary skill in husbandry can go far to reduce the heterogeneity which is the natural feature of crop and animal products. But the fact remains that the standardization of nearly all farm products involves the grading of the products *after* production at some stage in their journey to the consumer.

It is desirable that this grading should take place near to the point of production so that the handling of unsaleable produce can be eliminated at the earliest stage possible. For some products, grading by the farmer is the only practicable method ; for example, highly perishable fruit must be graded by the picker in order to avoid over-handling. But the small quantity of any single product which is usually grown on the average farm makes it generally necessary to assemble the output of many farmers before grading can be efficiently and economically performed. In the case of a few products such as wool, grading may be a highly specialized process for which neither the farmer nor the assembling agency has the necessary training. But whether the grading is carried out on the farm or elsewhere, it is essential that the farmer should be made aware of the benefits accruing by being paid for his produce on a grade basis.

The advantages of the standardization of agricultural produce have been recognized in several countries by the establishment of statutory grades to which it may be necessary for produce to conform before sale, or at least before export. Much of the agricultural imports into this country before 1939 consisted of such standardized and branded produce, a notable example being the " Lur Brand " produce of Denmark.

In 1923 the Linlithgow Committee asserted that British farmers had lost the home market for many of their products because they had failed to take any steps to grade and standardize their goods. Soon afterwards official steps were taken to remedy this position. The Markets Branch of the Ministry of Agriculture and Fisheries in a series of reports [1] covering the major products of British farming made concrete proposals for the adoption of suitable standard methods of preparing goods for market. This official encouragement of standardization culminated in the passing of the Agricultural Produce (Grading and Marking) Act of 1928. This Act gave powers to the Ministry of Agriculture and Fisheries to prescribe grade designations to indicate the quality of any agricultural product. It also established an official trade mark—the *National Mark*—to be used only on produce of British origin conforming to statutory grades and by persons officially authorized to apply the mark. By 1939 grading and marking schemes for a number of commodities such as fruit, eggs, beef and flour were in operation. The adoption of these schemes by producers was voluntary, but the grades and marks themselves were statutory.

Packaging

The use of packages is closely connected with grading and standardization. Most farm products require to be put in packages before they can be economically marketed ; e.g. eggs and potatoes are sold in crates and hampers, milk in churns and bottles, butter and cheese in tubs or cartons, etc. Adequate packaging facilitates the handling of the product, protects it from dirt and damage, reduces costs of storage and transport and enables consumers to buy in convenient units. As indicated above the use of suitable containers is also closely linked with grading and standardization, since they facilitate the trade-marking or branding of the produce.

Processing

Many agricultural products such as milk, eggs, fruit and vegetables may be consumed in the form in which they leave the farm. But the greater part of the produce sold by farmers is now subjected to further processing or even manufacture before it reaches the consumer. This may be necessary in order to convert the product into a consumable form, or it may be necessary for preserving the product. Examples of the former are the slaughter and carcase-dressing of livestock, the milling of wheat, the conversion of milk into butter and cheese, and so forth. Processing for the purpose of preservation is important for the more perishable farm products, e.g. canning or bottling of fruit and vegetables, pickling of eggs, etc.

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[1] Ministry of Agriculture and Fisheries Economic Series (Orange Books)

This processing function, which used to be carried out by the farmers themselves, has been increasingly delegated to non-farming specialists. It is not always easy to establish a clear distinction between processing and manufacturing in this connection. But where the farm products are not regarded as the raw material for other industries (i.e. as production goods) the function of processing is rightly regarded as a stage in the marketing of the consumption goods which farmers produce. Nevertheless, as was pointed out in the discussion on the demand for farm products, there is a marked tendency for farm products to receive an ever-increasing measure of processing after leaving the farm and before reaching the consumer, and this tendency has made the processing agencies partake increasingly of the nature of secondary industries.

Storing

The need for storage arises from the seasonal nature of most farm production. Thus crop production is almost entirely seasonal and the whole output is harvested and becomes available in a few weeks each year. Again commodities such as milk and eggs which are produced throughout the year have also their flush seasons. The storage of the surplus from the seasons of plenty for use during the seasons of comparative scarcity has always been practised by man. The influence of this seasonal production on prices was discussed in the previous chapter when it was shown that where the crop is immediately translated into effective supply the result on prices is ruinous to the farmer. Under commercial agriculture the economic motive for storage is, therefore, to hold over supplies during periods of glut until a more favourable period for selling arrives. This orderly release of supplies, which storage makes possible in the case of seasonally produced commodities, is a fundamental stage in efficient marketing. It benefits both producers and consumers.

Transporting

Transport is the most obvious of all the services involved in the marketing process. In the journey from farm to consumer three stages of transport are usually involved—from the farm to the point of assembly, from the assembly point to the urban market and from the urban market to the consumer. The farmer himself often undertakes the first stage, though the use of local carrier services is becoming increasingly important. Long-distance transport is almost entirely undertaken by railway companies and by specialist road-transport contractors. Efficient transport depends throughout on speed and on the use of suitable vehicles for the conveyance of living animals and highly perishable or easily damaged farm produce. Apart from their influence on marketing efficiency, the costs of transport have an important effect on the localization of agricultural production since cheap transport rates may extend the area of production while high rates restrict it.

Financing and Risk-bearing

The processes of marketing, like the processes of production, must be financed. It is not enough to meet the costs of the actual operations, for financing is also essential to help all the agencies concerned to hold and sell the produce to the best advantage. To a large extent the need for financing is proportionate to the length of time the whole process of marketing takes. This is one of the chief reasons why it is necessary to have a marketing system which reduces the time element as much as possible. As mentioned already, grading helps financing, because grading facilitates the evaluation of the goods on the security of which the financial assistance is forthcoming.

The time element inherent in marketing also adds greatly to the risk involved. There are two main types of risk. The first is the physical risk that the produce may deteriorate, or be damaged or even be lost or destroyed. This kind of risk may often be insured against through specialist insurance agencies. The second type of risk is due to price fluctuations which may occur during the period of marketing. " Hedging," which is the process of " future trading," is a commerical device to insure against this kind of risk and is applicable to the marketing of standardized non-perishable commodities such as wheat. Of course the risk element in marketing bears a direct relationship to the efficiency of the marketing system as a whole.

Marketing Costs

Each of the marketing services just described, as well as the job of buying and selling, adds to the cost of the farm product by the time it reaches the consumer. The term *distributive margin* is generally used to denote the spread between the price which the farmer gets and the price which the consumer pays for the same product. This margin between farm prices and retail prices reflects the costs of marketing and it varies widely for different groups of products.

While it is very difficult to measure the distributive margin with any exactitude, the many official and other studies of distribution which have been carried out enable certain broad generalizations to be made. In the case of milk for the liquid-milk trade the British farmer receives about one-half of the retail price paid by the consumer. In the case of meat the distributive margin varies from 25 to 30 per cent, which means that the farmer obtains about three-quarters of what the consumer pays for meat. Taking the fruit and vegetable trade as a whole, the grower usually receives about half the retail price, but the margin here is very variable, and the grower's share of the retail price sometimes falls as low as a third or even less. Taking the whole of the farm products of this country it is probable that before 1939 the farmer obtained less than eightpence of every shilling paid by the consumer.

It is obvious from these general estimates that distribution costs are relatively high in agriculture. There are many reasons for this—reasons which are inherent in the physical nature of farm products, and in the characteristic economic structure of the agricultural industry. Some of the more obvious reasons are : (*a*) the difficulty of assembling the small outputs of thousands of producers scattered all over the country, (*b*) the greater incidence of transport costs especially for bulky and low-priced products, (*c*) the difficulties of grading due to the wide variations in type and quality of output both of livestock and of crop products, (*d*) the impossibility of maintaining regular production and supply, (*e*) the greater need for storing and processing to cope with seasonality of production, (*f*) the greater risk resulting from the need for storage and from the handling of highly perishable products, and (*g*) the strict limits within which sale by contract or by sample is possible.

Notwithstanding the above considerations it is often asserted that the costs of marketing farm products are unnecessarily high. As long ago as 1923 the Linlithgow Committee stated that " the spread between producer's and consumer's prices is unjustifiably wide. Taken as a whole, distributive costs are a far heavier burden than society will permanently consent to bear." Since then there has been little, if any, improvement. While anything like a full discussion of the economics of marketing is outside the scope of this book, it will be useful to indicate briefly three points of criticism which have been made against the system especially from the view point of the agricultural producer.

The most frequent criticism is that there are too many middlemen, and that this excess of numbers results in unnecessary duplication of function with consequent waste of resources and inflation of costs. This criticism applies, in the main, to the two extreme stages of the marketing system—to the numerous and somewhat nondescript agencies concerned with the collection of produce at the farmer's end, and to the army of small retailers and shopkeepers at the consumer's end. When several of these distributors are competing in an area they tend to overlap, routes are duplicated or lengthened and costs are higher than they might be if some measure of rationalization was practised. As stated earlier, during the war the compulsory rationalization of the retail distribution of milk resulted in substantial economies in man-power as well as in horse-power and petrol. Even more spectacular economies attended the rationalization of livestock markets through the reduction in the number of slaughter-houses, the elimination of cross-transport and the ousting of all unnecessary intermediaries. But it is possible to exaggerate the advantages obtained under war-time conditions when quality produce and consumers' preferences were at a discount. In judging the degree of redundancy amongst distributors in more normal times due weight must be given, on the one hand, to the fact that orderly and graded production in farming is the exception rather than the rule, and on the other hand to the increasingly exacting and sometimes extravagant character of the consumer's demands both as to quality of product and as to standard of service.

While the above criticism puts the emphasis on the wastes of the competitive system in marketing, the second criticism stresses the view that competition between middlemen is seldom perfect. In particular it is often stated that the distributive trades in agriculture are in a sufficiently strong position to make excessive charges for the services they perform. This situation of imperfect competition is supposed to take three main forms. First, in agricultural marketing some degree of local monopoly is inevitable, since farmers as a class are unable to devote the necessary time and energy to ascertaining the relative prices paid by competing dealers so as to be able to transfer their business from one to another accordingly. Secondly, the competition between dealers is often more apparent than real since it is circumscribed by the existence of buyers' " rings " and secret understandings. The semblance of competition may be effectively maintained while real competition is being progressively weakened by collusions and agreements. Thirdly, the really big buyers of agricultural products—the wholesalers—are supposed to be powerful enough to eliminate any effective competition and to demand a high premium for their services at the expense of producers and consumers.

Finally, the marketing system is criticized for its rigidity and consequent inability to cope with the inevitable fluctuations which are such a prominent feature of the supply of most agricultural products. Indeed, the criticism is often put in the more positive form that the distributive trades stand to gain from the exploitation of the substantial surpluses which tend to be the rule rather than the exception in agricultural production. " The distributive trades benefit from surpluses by being able to buy from the producers at scrap prices and sell to consumers at very little below normal figure. This tendency has increased because the more highly organized the distribution of food to cities, the greater the overhead costs of moving the supplies. These remain a standing charge whether producers' prices are kept high or low. In short, the distributive system is not flexible enough to pass on the full advantage of a large crop to the consumers, while it may be as profitable in many cases for the producers to sell a large crop at low prices as a short crop at high prices. The farmer does not always want a constant price per unit, he would prefer a constant return for his output, whether high or low. The distributive trades have been unable or unwilling to cope with this situation to the advantage of consumer and producer, whatever they may have done for themselves." [1]

These criticisms of the marketing system derive mainly from the belief that distributors are not primarily organized in the interests of either producers or consumers. There is even a suspicion that they have a vested interest in perpetuating the disorderly production which even the most efficiently run

[1] Maxton, J. P. (unpublished manuscript)

agriculture cannot entirely eliminate. Thus, there is little, if any, inducement to educate or encourage farmers to adjust their production in the matter of quality and quantity to meet the real requirements of the market. Hence the advocacy of action by producers themselves to perform at least some of the services now undertaken by middlemen, thereby reducing marketing costs and retaining for themselves a larger share of the final price paid by the consumer. In other countries such action has generally taken the form of co-operative organizations. Co-operative marketing has also been used in this country, but here it has been overshadowed by the organization of farmers for industrial self-government under the Agricultural Marketing Acts.

CO-OPERATIVE MARKETING

Co-operative marketing associations are at once a part of the general marketing system and a part of the general co-operative movement. The co-operative movement in agriculture takes many forms of which the more important are the credit and insurance societies, and the purchasing and marketing associations. But whatever form it takes the co-operative enterprise is based on the principle of mutual advantage since it is formed because a number of persons recognize that it is in their common interest to work together. Since the days of Robert Owen and the early attempts of the Rochdale pioneers the movement has developed a characteristic code of principles which distinguish it from every other form of business organization. This has received legal recognition and today co-operative societies are registered with the Registrar of Friendly Societies under the Industrial and Provident Societies Acts, while other business concerns are registered with the Registrar of Public Companies under the Companies Acts.

There are at least three fundamental principles which differentiate co-operative associations from joint-stock companies and other commercial businesses. The first principle is that of democratic control of management secured by the rule that every member of a co-operative society has one vote only irrespective of his shareholding, while each member's shareholding is limited to a fraction of the total capital. Moreover, membership is not restricted to any special group but it is open to all *bona fide* producers of the commodity handled by the society concerned. The second and one of the oldest of all co-operative principles is that the dealings of a society are restricted to its members, and members are under an obligation to deal with the society and only with the society for the class of business concerned. The third principle governs the method of sharing the surplus obtained from the society's activities. The " profits " are not distributed to the capital-holders in proportion to their holdings of capital. Only nominal rates of interest are paid on the capital invested, the remaining surplus being divided between the members in proportion to the amount of business each has transacted through the society. This patronage dividend is, therefore, a very different thing from the dividend on shares which the joint-stock company pays. It is the justification for the co-operative societies' claim that they do not make profits, but only a surplus over expenses which, at the end of the year, is repaid to the members in proportion to the amount of business which each has with the society.

From the economic standpoint the application of these principles to the task of agricultural marketing is only justified in so far as the co-operative organization performs the functions of marketing more efficiently than the middleman system it supersedes. It is necessary to indicate briefly some of the advantages and benefits claimed for the co-operative method of marketing farm produce. It will be appreciated that some of these advantages might apply equally to other forms of collective action by farmers for marketing purposes.

The first advantage derives from the replacement of the profit motive by the motive of service to members. The co-operative society does not set out to buy its members' produce from them as cheaply as it can. On the contrary, its aim is to sell the produce of its members at the best possible price. Moreover, having secured the best price, the society returns that price to its members after deducting the bare costs incurred in securing it. In this way, farmers retain the greatest possible share of what consumers pay for farm produce.

Secondly, it follows from what has just been said that the co-operative society does not set out to exploit the disadvantages inherent in the nature of farm production, especially the disadvantages of seasonality and perishability. On the contrary, co-operative societies have pioneered marketing services such as grading, storing and processing in the interests of producers, where middlemen had found it more profitable to see conditions of disorganized and fluctuating supply perpetuated. It has often happened that by their example the co-operative societies have forced middlemen to render services which otherwise they would not have bothered to perform.

Thirdly, co-operative societies have likewise been successful in eliminating trade abuses made possible by the characteristic small-scale structure of the farming industry. Thus they strengthen the bargaining position of farmers *vis-à-vis* the trade even when they perform only the earlier functions of the marketing process such as assembling and storing. Again, where competition between middlemen may have degenerated to a mere formality, the co-operative society has been able to induce real competition and thereby help to improve producers' prices. In many cases co-operative societies have been strong enough to secure other trade advantages such as lower transport rates, more favourable credit facilities and so forth.

Fourthly, the co-operative society should be in a particularly favourable position to ensure regularity of supply and to control the flow of production on to the market. Where the co-operative principle of loyalty of members to the society is observed it is generally embodied in firm contracts whereby members undertake to deliver all or an agreed proportion of their produce to the society. This contract system assures to the society a steadier volume of goods on which to plan the appropriate marketing organization. But it is also of great benefit to farmers since it cushions the impact of seasonal production especially when the contract system is accompanied by pooling arrangements whereby the maintenance of the steady supply is shared by a large number of farmer-members.

Finally, perhaps the most important advantage of the co-operative marketing system is that it makes possible a better integration of marketing with production. The contract system is of particular significance in this connection. So long as farmers leave most of the assembling, grading, packing and storing of their produce to middlemen there is a danger that they do not appreciate the influence on prices which the proper performance of these functions exerts. For example, unless the producer is paid for his produce on a grade basis it is the middleman who may gain all the benefit from the superior prices which consumers are prepared to pay for the higher-grade article. Co-operative societies, using the contract system, are in a particularly strong position to bring home to the individual producer the advantages of producing better and more uniform produce of a variety suited to the tastes of consumers. It is this mutual influence on each other of efficient marketing and efficient production, coupled with the part which the co-operative ideal plays in the social life of the rural community which gives point to Sir Horace Plunkett's dictum that the aim of agricultural co-operation is to ensure " Better Farming, Better Business, Better Living."

The adoption of the co-operative system of marketing farm products has made rapid headway in many countries during the present century. Some of the more notable examples are the Californian Fruit Growers' Exchange, the Canadian Wheat Pools and the New Zealand Produce Export Board. Nearer home, co-operative marketing has been highly successful in Irish agriculture, and Denmark has organized its large export trade in butter, bacon and eggs largely on co-operative lines. In Great Britain, on the other hand, the co-operative marketing of farm products has been relatively unimportant. It was started here during the closing years of the nineteenth century, and made its biggest stride during the first fifteen years of the present century. At no time, however, did the turnover of co-operative marketing societies account for more than about four per cent of the total value of agricultural produce marketed by British farmers.

Many reasons have been suggested in explanation of the relatively weak position of co-operative marketing in Great Britain. Some stress the essential difference between production for a home market and production for export. Others stress certain essential features of the structure of British agriculture and the character of the British farmer. Still others put the emphasis on the failure to observe sound business methods and basic co-operative principles in the administration of the societies launched in this country.

In the first group of reasons the explanation for the British farmer's failure to combine for marketing is attributed to an understandable scepticism about the economic advantages to be gained from organization in a country where markets are so close at hand. Living as he does in the midst of his markets the British farmer has, at least, never failed to receive some offer for his produce. Conditions are very different in countries such as Denmark or New Zealand which cater for an export trade, or in countries such as the United States where even the home market may be thousands of miles away from the producer. In these countries centralization and pooling are almost a pre-requisite for obtaining any sale at all for much of the farmer's produce. Indeed, some form of co-operative action on the part of producers is almost " a child of necessity." Moreover, not only is organization for marketing forced on farmers under these conditions, but the conditions themselves facilitate the task of organization. This is especially true of exporting countries where the bottle-neck of the ports provides a convenient means for establishing control over distribution and sale. It is possible to reconcile this explanation for the absence of co-operative marketing in this country with the fact that there has been a comparatively healthy development of co-operation for the purchase of agricultural requisites. In other words, reluctance to co-operate for marketing is not to be attributed to a dislike of co-operation as such, but to a belief that since the producer is near several markets it may be better and cheaper to retain the system of individual sale.

But the failure of co-operative marketing in this country has often been attributed to the supposed incorrigible individualism of the British farmer and his dislike of any collective action. In particular this individualism manifests itself in a determination to cling to the right to act as his own salesman. The country dealer knows how to exploit the farmer's belief in his natural flair for buying and selling, and many farmers have become attached to the personalities of the middleman system. This has helped the middlemen to increase their economic and financial hold on the agricultural industry, and has added to the difficulty of supplanting the system by any form of co-operative organization.

Again, the heterogeneous character of the farming industry in this country does not facilitate the growth of co-operative marketing. In the first place the predominance of mixed farming means a multitude of products for sale on most farms. But since co-operative marketing societies are best organized on a commodity basis this would render it necessary for the mixed farmer to belong to several societies. In the second place the greatest diversity also obtains in the size of farms and in the financial and social standing of farmers. This means the absence of that community of interest on which successful co-operation rests. Thus the large farmer may often be able to perform his own marketing services efficiently, and even when he joins a co-operative society he may consider that the democratic principle of one man one vote does not give due weight to his contribution to the trade of the society. In short, in this country diversity of farming and diversity of farmers makes it difficult to establish, even within a single county, that common ground which is the essential basis for the erection of a co-operative venture.

Finally, many of the attempts made to run co-operative marketing societies in this country were unsuccessful because their promoters either failed to observe sound business methods, or failed to apply some of the basic co-operative principles. Part of the explanation for the lack of sound business practice must be attributed to the enthusiasm of pioneers more often concerned with propagating co-operative principles than with the improvement of the economic and technical efficiency of the marketing system. Thus societies were sometimes formed when no real justification for them existed. Again the desire to attract members often led to the adoption of disastrous business practices. Some of the more serious of these practices were disregard for the need to ensure a minimum economic turnover, the excessive use of borrowed capital, too great an investment in fixed assets, the adoption of over-generous price policies, lack of any real attention to the technical aspects of the marketing process, and failure to employ skilled and well-paid managers. But paradoxically enough the most serious business shortcoming was the failure to observe the fundamental co-operative principle of loyalty between members and society. Indeed, few societies were ever in a position to enforce the firm contract which alone could ensure a guaranteed supply, the one essential for successful business.

There were, however, two co-operative marketing organizations—the Kent Hop Growers and the Scottish Milk Agency—which did sign up contracts with members on a sufficient scale to ensure the control of a large proportion of the supply for the markets concerned. But after a brief spell of spectacular success both organizations failed. At the time their failure was generally attributed to the action of the minority of producers who remained outside the organizations. This minority, while sharing in the improved market and price conditions brought about by the organizations, did not contribute to the cost of the organizations nor did they submit to that measure of discipline needed to maintain the necessary control of output and supply. Indeed, it became good business for the non-co-operating minority to increase their production. But this increase in production greatly added to the burden of responsibility which the farmer-members of the organizations had to shoulder. It was only a matter of time before this burden became intolerable and the organizations broke down.

Much the same fate, for much the same reason, befell other attempts at collective bargaining by farmers during the nineteen-twenties. It was out of the failures of the more conspicuous of these attempts that the Agricultural Marketing Act of 1931 arose. The ostensible motive for this Act was to strengthen the hands of a majority of producers wishing to sponsor a scheme for orderly marketing by giving them legal powers to force the dissident minority to share in the burdens as well as in the benefits of any such scheme. But, in spite of its title, the uses made of this Act, as well as of the supplementary Act of 1933, were by no means mainly concerned with the reorganization of marketing. On the contrary, they form an important aspect of the experiment in a controlled economy which was such an important feature of agricultural development in the nineteen-thirties.

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No. 25 *Marketing of Vegetables*
No. 29 *Marketing of Sheep, Mutton and Lamb*
No. 31 *Marketing of Calves and Veal*
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No. 35 *Organisation of Wool Marketing*
No. 49 *Co-operative Marketing of Horticultural Produce*

CHAPTER XII

IMPERFECT COMPETITION IN AGRICULTURE

So far the discussion throughout most of this book has assumed the existence of free competition both amongst producers or sellers and amongst consumers or buyers. In a free market thousands of producers of the same product sell their supplies on the market as individuals, while thousands of consumers buy these supplies also as individuals. There is no agreement or collusion between producers on the price at which they will sell, nor is there any agreement or collusion between consumers on the price they will pay. In other words, the producers compete with one another for the custom of the consumers, while the consumers compete with each other for the available supply. Moreover, in the free market no single seller or group of sellers, and no single buyer or group of buyers will be big enough to affect the market price by their decisions. It is only under such conditions of free competition that the price mechanism can fulfil its threefold functions of rationing consumption, guiding production and moving products through the channels of trade.

If competition between sellers or competition between buyers is largely or completely eliminated conditions of monopoly, which is the antithesis of free competition, are said to exist.[1] The rise of monopoly conditions is a feature of the present phase of economic evolution, and it is necessary to examine how far agriculture has been affected by this development.

AGRICULTURE AND MONOPOLY

In many ways agriculture remains the stronghold of free competition, especially of competition between producers. Nevertheless, agriculture has come increasingly under the influence of monopoly conditions since farmers have to deal both in buying and in selling with monopolist or quasi-monopolist organizations. In so far as this is so the prices at which farmers buy and sell can no longer be regarded as being determined automatically by the interplay of demand and supply. It will be convenient to refer briefly to the three main situations in which agriculture has departed from the conditions of the old price system through being subjected, both directly and indirectly, to monopolist influences.

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[1] Strictly speaking, the term *monopsony* is used to cover the absence of competition among buyers.

(1) The first situation has to do with the prices which agriculturists pay for the producer goods which they purchase, of which the more important are implements and machinery, fuel, manures and feeding-stuffs. Most of these goods are produced by large-scale enterprises which have some element of monopoly in them. Indeed some of the organizations concerned are among the best-known examples in this country of monopoly undertakings. Thus the supply of nitrogenous manures is in the hands of the biggest of all British trusts, potassic manures are controlled by a single syndicate and a virtual monopoly exists for phosphates. Before 1939 feeding-stuffs constituted the biggest single item of raw materials purchased by farmers in this country. In the case of feeding-stuffs, and more especially oil-cakes and concentrated foods, a few large firms control a substantial proportion of the total supplies. Firms making agricultural machinery have also amalgamated and at present, although more than 800 firms make agricultural machinery in some form or other, a few large firms hold an increasingly commanding position in the trade. In fact most of the things the farmer buys for his farm are supplied to him by large-scale undertakings of one form or another.

These large-scale undertakings are generally in a position to fix the prices at which they sell their goods to the farmers. Thus some of the firms concerned operate on a large scale with trade-marked products, for which they are able to charge more or less their own prices. It is true that there may be other firms competing for the same demand, but they will also have trade-marks of their own, and the competition is not as direct as, say, one farmer selling wheat in opposition to another farmer. But there is also the other kind of firm, like the big fertilizer combines, which have more of the real monopoly element, and which can ignore the competition of other firms since these are largely operating by agreement.

The control of supply, or the greater part of it, which the more monopolistic of these concerns possess makes it possible for them to fix their prices at the level which they consider will yield them the maximum returns above their costs of production It is true that they cannot entirely ignore the influence of demand, for, to a certain extent, the result of their action is circumscribed by the elasticity of demand for the goods they produce and sell. That is why monopoly prices are generally fixed at what " the traffic will bear." This means that if a low price is likely to yield a higher total return than a high price, a low price is fixed, and vice versa. Within this limitation, however, the monopolist is able to manipulate prices so as to maximize his total profits, for he knows that the price he fixes will not be endangered by the supplies of competing producers. In other words the monopolist is able to determine the price he thinks necessary because he can protect that price by producing and selling only those supplies which buyers will take at the price fixed.

Incidentally, the existence of these non-competitive prices for farm requisites has an important bearing on the adverse influence of a falling price level on the fortunes of farmers discussed in Chapter IX. Thus the success with which the large-scale business is able to safeguard its prices is one of the significant factors which accentuates the lag between the movement of farming costs and the movement of farming returns when the general price level is falling.

(2) The second situation has to do with the status and powers of the farmers' customers, that is, the persons or organizations who are the primary purchasers of the commodities which farmers sell. These primary purchasers include (*a*) consumers who buy direct from farmers, (*b*) middlemen

who buy for resale to other intermediaries or to consumers, and (*c*) processors and manufacturers. In dealing with marketing in the previous chapter it was shown that farmers sell only a relatively small proportion of their produce direct to consumers, so that the bulk of the farmers' primary customers are middlemen, processors and manufacturers. There has been a marked trend to eliminate competition amongst these primary customers in order to be able to present as united a front as possible in arranging the prices and terms on which they buy from farmers. This trend has taken many forms from the well-known development of powerful combines such as the United Dairies Ltd to the looser, but no less effective, trade associations of wholesalers and retailers with their intricate systems of price-rings and agreements. But whatever form these methods in " restraint of trade " may take, they all have the one aim of fixing arranged prices at which farmers' products shall be purchased and protecting such agreed prices by the elimination of competition or under-cutting by the buyers themselves.

(3) The third situation concerns the position of farmers themselves and any powers they may have to influence prices through the elimination of competition. While on the producing side agriculture continues to be conducted almost entirely on an individualistic basis, farmers have nevertheless taken some important steps to act together in the conduct of their affairs. The most notable step has been the development of the National Farmers' Unions of England and Wales and of Scotland. The object of these unions is to strengthen the position of farmers by buttressing individual action by a strong collective organization in the political as well as in the economic field. Thus the farmers' unions aim at widening and extending their influence " by every means possible, and to include among (their) members every practical agriculturist . . . so that a united front might be presented on all agricultural topics."

Another important step has been the development of co-operative societies for the supply to farmers of agricultural requisites such as feeding-stuffs, seeds, manures and implements. In 1938 farmers' co-operative requisite societies had a total turnover of over £12 5 million In the areas in which they functioned, these societies substantially strengthened the bargaining position of farmers *vis-à-vis* the powerful traders from whom they bought their requirements.

Finally, during the nineteen-twenties, farmers made several attempts to counteract the increasingly weak position in which they found themselves as a result of having to sell their produce to monopolistic buyers. The attempts at co-operative marketing have already been described in the previous chapter. Other notable attempts were concerned with the fixing of milk prices in England and Wales and especially for the London market. These attempts took the form of *collective bargaining*. Collective bargaining is the substitution of mass bargaining between the accredited representatives of all buyers and the accredited representatives of all sellers for the existing individual bargaining between single seller and single buyer. But these attempts to sell on co-operative lines or to fix prices collectively were never wholly successful since the organization concerned were never really able to enforce their bargains. This was largely due to the fact that they were never able to exercise the effective control of supply, which is the *sine qua non* for the maintenance of a fixed-price system. In other words the competition of farmers, one with the other, as producers could not be effectively eliminated, and it was therefore impossible to regulate supplies in conformity with the quantities which buyers were prepared to take at the prices fixed.

This inherent inability of agriculturists to establish effective collective bargaining by voluntary means culminated in the passing of the Agricultural Marketing Acts of 1931 and 1933 which gave farmers the power to create monopolies by law. The Agricultural Marketing Boards set up under the Acts resembled more or less closely the form of monopoly which is technically known as the *cartel*. The cartel lends itself in many ways to the characteristic small-scale structure of the agricultural industry especially since it does not interfere at all in the internal management of the independent producers who constitute its members. It acts as a monopolistic selling agency on their behalf, leaving production to be carried out by the independent producers under competitive conditions.

Before considering the various marketing boards of this type which were set up it is necessary to give briefly the more important provisions of the legislation on which they were founded.

THE AGRICULTURAL MARKETING ACTS

The Agricultural Marketing Act of 1931 gave powers to producers to establish marketing schemes for the regulation of the marketing of agricultural products in this country. For the purpose of the Act an agricultural product was defined to include " any product of agriculture or horticulture and any article of food or drink wholly or partly manufactured or derived from any such product." The Act was permissive in character, and it was for producers, and producers only, to take the necessary steps to put the provisions of the Act into practice. The more important of these provisions are summarized below.

In the first place, as already stated, powers were given to producers to submit a scheme for regulating the marketing of their product. When any such scheme comes into full operation its provisions are binding on all producers of the regulated product in the area concerned unless they are specifically exempted. Marketing schemes may operate on a national, regional or local basis according to the requirements of the product concerned.

Secondly, schemes are to be administered by *Marketing Boards* composed of the elected representatives of registered producers together with a small co-opted element. Three types of board may be formed : (*a*) a trading board, itself buying and selling the regulated product, or acting as the sole agent for its sale, and engaging if necessary in manufacturing other commodities from the regulated product ; (*b*) a regulating or administrative board, accepting no commercial risk and undertaking no trading, but limited in function to the issue of instructions on some or all of the methods and operations involved in marketing the regulated product; or (*c*) a board exercising to a varying extent both trading and regulating functions. The powers exercised by any particular board will depend on the nature of the scheme concerned. It is for the producers when preparing a scheme to select those powers which are applicable to the needs of the particular case.[1]

Thirdly, a marketing scheme becomes operative in stages. Every scheme, by whomsoever prepared, must be submitted to the Minister of Agriculture by persons substantially representative of the producers of the regulated product. If objection is taken, a public inquiry is held. Thereafter the Minister may lay the draft scheme, with or without modifications, before Parliament. If Parliament approves, an approval order is made bringing the scheme into force. Then follows a poll of registered producers. If the requisite majority (i.e. two-thirds of the total number of registered producers, capable of producing two-thirds of the product) is in favour, the scheme automatically comes into full operation after the completion of a " suspensory period," which must not be less than one month or more than two months after the declaration of the poll.

Fourthly, marketing schemes are financed from a fund for each scheme which constitutes its ordinary revenue and is contributed by the registered producers concerned. There is also provision for financing the initial stages of a scheme from an Agricultural Marketing Fund provided by Parliament and administered by the Minister.

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[1] A Marketing Board may have any or all of the following powers:

(*a*) to buy the regulated product and manufacture other products from it;
(*b*) to sell, grade, pack, store, adapt for sale, insure, advertise and transport the product;
(*c*) to require the registered producers to market the product in such quantities as may be determined, only to or through the agency of the Board;
(*d*) to buy, and to sell or hire to producers anything required to produce, adapt, or sell the product;
(*e*) to determine the description of the product which may be sold and the price at, below, or above which, and the persons to or through whose agency, the product may be sold;
(*f*) to regulate grading, marketing, packing, storing, adaption for sale, insuring, advertising and transporting;
(*g*) to demand information from producers;
(*h*) to promote or conduct co-operation, research and education.

Fifthly, safeguards are provided, both during the preparation and operation of schemes, against the misuse of the extensive powers given to the Marketing Boards. The provision for the initial public inquiry, the affirmative resolution of Parliament and the poll of producers have been mentioned above. In addition, provision is made for a *Consumers' Committee* to consider complaints by consumers, and for a *Committee of Investigation* to consider complaints by bodies other than consumers (e.g. distributors and manufacturers) as well as reports made by the Consumers' Committee. The Minister reserves the right to advise Parliament to take measures against any actions of Marketing Boards which he considers to be contrary to public interests. A scheme may be amended or revoked by the Minister, acting on the report of the appropriate Committee of Investigation and subject to parliamentary ratification. Furthermore, an aggrieved producer has the right to submit his grievance to arbitration or to appeal to the Minister. A substantial proportion of producers may demand a poll of producers on the question of the continuance or discontinuance of any scheme in operation.

Finally, provision is made to give assistance to producers in the difficult task of drafting detailed schemes under the Act. For this purpose *Reorganization Commissions* may be set up by the Minister charged with investigating existing marketing conditions, and the preparation of a scheme in the interest of the producers of a commodity concerned. But producers have complete powers to accept or modify or reject any scheme prepared for them by a Reorganization Commission. Reorganization Commissions may also be appointed for the purpose of reviewing the operations of a marketing scheme set up under the Act and suggesting any amendments or modifications necessary.

The Agricultural Marketing Act of 1933 supplemented the Act of 1931 in three important respects. First, it amplified the important power to limit supplies given to Marketing Boards under the Act of 1931 by adding the provision that such limitation of supplies should be in accordance with some previous *status quo*, i.e. "by reference to the quantity . . . which was in some past period produced, sold, or otherwise dealt with on particular land or premises or by particular persons." Second, it made provision for the setting up of *Development Boards* to co-ordinate the activities of a board marketing a primary product and a board marketing a secondary product prepared from that primary product. Third, the Act made provision for powers, in particular circumstances, to regulate the imported as well as the home-produced supplies of any product to which a marketing scheme under the 1931 Act might be applied.

The powers to control imported as well as home-produced supplies connected the operation of agricultural marketing schemes with the adoption of a protectionist policy by this country after 1931. Thus powers are given to the Board of Trade to regulate the importation of a product if it appears that such action is necessary in order to make fully effective the reorganization of a branch of the agricultural industry by a scheme under the 1931 Act. It is further provided that when the importation of a product is being regulated, the home output of that product or any related product may also be regulated, if necessary, by means of an order affecting sales.

In this way the quantitative regulation of the imports of agricultural products was linked up with the principles of marketing organization incorporated in the Act of 1931. Moreover, the Act of 1933 made it clear that any quantitative regulation of imports was to be contingent on the adequate organization of home agriculture. In effect this meant that the regulation of imports was offered as an inducement to British farmers to set up schemes under the Act of 1931.

The Act of 1933 also made provisions for the setting up of a *Market Supply Committee* as an impartial body whose chief function was to make a continuous and expert study of supply problems. It was to be the committee's duty to recommend regulations for the control of supply, and particularly to report on the need for controlling any competitive imports.

Up to 1938 marketing schemes under these two Acts had been set up for four agricultural commodities—hops, potatoes, pigs and milk. In the next section some of these schemes are examined primarily in order to illustrate their monopolistic influence on prices and on the control of supply.

STATUTORY MARKETING SCHEMES

The Hops Marketing Scheme was the only scheme to come into operation under the Act of 1931. The scheme is administered by a board composed of fourteen regional representatives of hop-growers, together with four special members elected by registered producers in annual meeting. The Board uses its powers to fix prices and to control supplies to the fullest extent, and the scheme it administers is highly monopolistic in character. Indeed the control of hop prices as well as of the production of hops is almost absolute. It is this which makes the scheme of special interest, notwithstanding the relatively small importance of hop-growing in the general agricultural economy of the country.

The scheme constituted the Board the sole agent to, or through, which the sale of hops grown by registered producers can take place. The Board must accept all hops offered unless they are contaminated ; but it also has the power to destroy any hops surplus to market requirements.

The Board fixes the price of hops in agreement with the Brewers' Society for five years in advance. The proceeds of all sales are pooled, and from this pool registered producers are paid according to the quality and quantity of hops delivered. If the deliveries in any year are in excess of the demand at the price fixed, the returns of the individual grower will depend not only upon that price, but upon the proportion of the total crop remaining unsold and which has to be carried over to the following year or eventually destroyed.

But the scheme makes drastic provisions against the contingency of over-production. These provisions are embodied in the "quota" regulation. Each grower is given a *basic* quota which is equal, in general, to the average acreage of hops grown on his farm between 1928 and 1932. But a grower's *annual* quota will depend upon the Board's estimate of the total market demand for hops each year. If this demand exceeds 110 per cent of the total basic quotas, then new basic quotas are allotted to the highest bidders. Any hops sold in excess of the annual quota will only be paid for if there is any money left in the pool after all quota hops have been paid for.

In this way, the rate of expansion of hops production by existing growers was effectively limited. The regulation was even more effective in restricting the right to grow hops to those farms with basic quotas. Thus for all practical purposes it virtually barred the entry of new producers except when "quota" farms fell vacant or when new basic quotas were allotted by competitive tender. Moreover, through these provisions the right to grow hops has become a marketable commodity, and hop quotas have been bought and sold at the rate of about £180 per acre. "No better example could be found of the creation of values by means of artificial scarcity."

The Potato Marketing Scheme, in contrast to the Hops Scheme, was mainly regulatory, and the Potato Marketing Board did not attempt to obtain powers to fix prices. The Board directed its attention to the regulation of supply and to the problems associated with the violent fluctuations in supplies consequent on the fluctuations in yields and in acreages, which had previously characterized the potato industry. This it did through exercising its power to "determine from time to time the description of, the terms on which and the persons to, or through the agency of, whom potatoes may be sold by registered producers."

Three main methods for controlling the supply of potatoes on the ware market were introduced. *First*, each year at lifting-time the Board estimated the total quantity of ware potatoes likely to be available for human consumption until the end of the following August. On the basis of this estimate the Board controlled the flow of potatoes from farm to market by the "riddle" regulation. In seasons when yields were high a large riddle was prescribed and potatoes which passed through had to be retained on the farm for stockfeed. Conversely in years of low yield a smaller riddle allowed a bigger proportion of the crop to be marketed. Potatoes surplus to human requirements were purchased by the Board, which had powers to deal in them and to conduct experiments on new uses to which surplus potatoes could be put. *Second*, the production of potatoes was regulated by fixing a basic acreage for each grower. Any grower could add permanently to his basic acreage by making a single and outright payment of an excess acreage charge of £5 for each acre so added. This levy on new acreage, although not prohibitive, was, nevertheless, an effective deterrent to the expansion of potato production through the increase of the acreage planted. Actually the area planted by registered producers became stabilized at about 525,000 acres in Great Britain. *Third*, imports of main crop potatoes were prohibited except under licence of the Board of Trade.

As stated already the Potato Board did not use any direct form of price control. But it licensed all potato wholesalers and required them to purchase potatoes at firm prices and prohibited sales on commission. The Board also endeavoured to eliminate price-cutting amongst wholesalers by instituting the Unfair Trading and Price-Cutting Committee. Local committees of merchants or farmers were also set up to stabilize farm prices by publishing weekly recommendations on minimum wholesale prices and minimum farm prices. Finally, the Board carried out experiments in retail consumption at low price levels. In this connection a notable experiment at Bishop Auckland explored the possibilities of increasing consumption by charging reduced prices to unemployed persons. The results were significant in that they indicated that, even in the case of a comparatively inelastic demand, such as that for potatoes, substantial expansion may be possible through the use of a discriminating price schedule.

The *Pigs Marketing Scheme*, the *Bacon Marketing Scheme* and the *Bacon Development Board* together provide the only example of the threefold organization which can be set up under the Agricultural Marketing Acts. The Pigs Marketing Board was a farmers' board dealing with the marketing of a primary agricultural product. The Bacon Marketing Board, on the other hand, was a curers' board dealing with the marketing of a secondary agricultural product. Finally, the Bacon Development Board was composed of representatives of the other two boards, and its purpose was to integrate their activities by encouraging the improvement of technique both in production and in marketing.

The Pigs and Bacon Marketing Schemes are of interest primarily for the provisions made for the regulation of supply and for a price policy linked to production costs and worked through a contract system of delivery.

The provisions for supply regulation aimed at stabilizing the supply of bacon and hams at the average of the years from 1925 to 1930. Home producers were to be given the first lien on this stabilized market, imports from abroad (mostly from Denmark) being reduced pro rata with any increase in the home production of bacon pigs.

A system of annual contracts at national prices for bacon pigs was the essence of the two schemes. (The schemes did not apply to the pork pig trade or to the store pig trade.) On the one hand, bacon curers undertook to make payment for bacon pigs at a stated figure per score, which was adjusted by formula in accordance with the fluctuations in the prices of feeding-stuffs (the most important single constituent of production costs). Provision was also made for appropriate extras to, and deductions from, the basic prices, depending on the quality of the carcase delivered. On the other hand, registered pig-producers undertook to give regular delivery and contracted to supply curers with a stated number of bacon pigs each month. In order to make regular delivery possible for small producers an important feature introduced into the contract was the principle of *group contracts*. This group contract gave the individual members of the group more latitude in production since it enabled them to share with their fellow-members the formidable task of delivering regular numbers of pigs throughout the year.

In spite of the opportunities for development which these schemes made possible they had a chequered career. While the control of imports through the quota regulations proved cumbersome and, in the first instance, burdensome to exporting countries, nevertheless, the cutting down of imported supplies did not have the desired effect on the price of the home-produced article. But apart from this, the system of the regular delivery of the specified quantities broke down. Farmers did not deliver the required quantities and the curers were therefore permitted to buy on the open market. The existence of the uncontrolled open market for pork pigs was blamed for the break-down in the contract. As a result of the difficulties encountered the scheme was suspended.

In 1939, however, it was in process of being reorganized under the terms of the Bacon Industry Act of 1938. This Act made provisions once more for the regulation of purchases and sales of bacon pigs ; the principle of long-term contracts and prices related to feed costs was re-introduced ; the new contract was to be based, for three years, on a price guarantee by the State. In matters of control the new scheme differed materially from the form of producer-control envisaged under the Agricultural Marketing Acts. Thus a stronger Bacon Development Board was set up, consisting of five members appointed by the Minister of Agriculture and the Secretary of State for Scotland, and four each nominated by the Pigs and Bacon Marketing Boards. This new Development Board was to be given control of all major matters of policy. The Pigs and Bacon Marketing Boards had to act in accordance with instructions from the Development Board in all matters except those in which the Act laid down that they could act independently. If either of the Marketing Boards failed to comply with such instructions or acted in a manner inconsistent with the Development Board's policy, their functions could, with the approval of Parliament, be transferred to the Development Board, and could not be retransferred for five years. The Development Board could continue to operate in the event of either the Pigs or Bacon Marketing Schemes being revoked, and could take over some of their functions. If the Bacon Development Board were wound up—and it itself had the powers to do so—both the Marketing Schemes would automatically be revoked.

The Milk Marketing Scheme for England and Wales [1] is, on the score of its operations, the most important of all the schemes set up under the Agricultural Marketing Acts. It involved the comprehensive organization of all milk producers in England and Wales, and in 1937–38 it sold over 1,000 million gallons of milk, and had a turnover of over £43 million. The scheme is administered by a Central Board comprising twelve representatives elected on a regional basis, together with three special members elected by registered producers in annual meeting, and two additional members co-opted by the elected members. There are also Regional Committees elected by the producers in each of the eleven regions into which the country is divided. It is the function of these Regional Committees to keep the Central Board advised on the operation of the scheme and the conditions prevailing in their regions.

The Milk Marketing Board established its monopoly of the milk supply by three provisions. *First*, all milk sold wholesale by registered producers was regulated by means of the Board's annual contract setting out the prices and the conditions of sale. Although the Board was itself a party to every wholesale contract, and no contract could be made except on conditions laid down by the Board, the position was arranged so as to interfere as little as possible with the normal relations of buyer and seller. Every farmer was still expected to find his own buyer for his milk, but if " after due diligence " he failed to do so the Board accepted responsibility for the disposal of his milk charging a small commission for doing so. But all contracts of sale between farmer and buyer had to be registered with the Board, and all payments for milk sold wholesale were made through the Board. *Secondly*, all milk sold retail by producer-retailers was regulated by means of a licence issued by the Board and stipulating the conditions of sale. *Thirdly*, all sales of milk by unregistered producers or by unlicensed producer-retailers were prohibited unless specific exemption was granted under the scheme.

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[1] There are also Milk Marketing Schemes for Scotland, Northern Ireland and the Isle of Man.

The Board used these comprehensive powers mainly for the purpose of enforcing a fixed price for milk. Under the scheme the supply of milk was left largely uncontrolled, and milk-producers were free to produce without even the restriction of a quota. Furthermore, the Board did not itself participate to any great extent in the actual purchase of milk, nor in the manufacture of milk products. But just prior to 1939 the Board owned a number of creameries in various parts of the country, and also one retail dairy. The Board's creameries were designed to handle milk in times of difficulties and so strengthening the Board's bargaining position in local marketing. They also provided the Board with first-hand information on the costs of manufacture and on the realization values of the products made. This information was necessary as a guide to the Board's price-fixing policy. The elaborate price structure which the Board adopted provides a first-class illustration of the working of price discrimination by a monopoly of the cartel type. The essential features of this structure must now be briefly described.

Nominally, all milk whether for liquid consumption or for manufacture was sold at the same wholesale price by all farmers within any one of the eleven regions. This price was called the *regional contract price* and formed the basis of all contracts for the sale of milk wholesale. This nominal contract price was fixed for a period of twelve months by collective bargaining between the Board and the Central Milk Distributive Committee which was a voluntary organization representative of all buying interests. The Board was under permanent obligation to consult the representatives of purchasers before prescribing the terms of contract each year. But in default of agreement the Board could fix its own price, or the matter could be submitted to arbitration.

The Board adopted the method of charging differential prices for all milk sold wholesale, for it realized that to insist on charging the same price in all the various markets for milk might result in reducing the total returns to producers. But the method of discriminating prices can only be practised where it is possible to segregate, or at least to distinguish clearly, between the various markets supplied. This the Board accomplished by making the buyers pay for milk on a *utilization basis*, i.e. the prices paid by the buyers varied according to the uses made of the milk purchased. The highest price was paid for milk used for liquid consumption. Then prices were graded down according to whether the milk was used for fresh cream, condensed milk, tinned cream, milk powder, butter or cheese. The lowest price was paid for milk made into butter or cheese, and this price was made to relate to the current prices of imported cheese. At the outset of the scheme the prices ruling for imported cheese, and therefore for the lowest category outlet for milk sold through the Board, was so low that the Government stepped in to guarantee from 1934 onwards to pay a subsidy to the Board to enable it to maintain a minimum price of 5d a gallon in summer and 6d a gallon in winter for all milk manufactured into cheese or other products. In later years, however, the cheese import price exceeded this guaranteed amount and, therefore, the subsidy was not paid over the whole period of the Board's operation.

The second aspect of the price structure was concerned with pooling the proceeds from these discriminating sales so as to distribute them amongst producers in proportion to their volume of wholesale sales. Eleven regional pools were operated in England and Wales, and each month all proceeds from the sales of milk were paid into the pools. After deducting certain charges and levies, the net sum remaining was divided by the total number of gallons of milk sold to determine the average regional pool prices for the month. A region's gross returns consisted of (*a*) payments for milk sold wholesale from the region, (*b*) payments from a levy on producer-retailers, and (*c*) payments from the government subsidy for manufactured milk. The two principal deductions to be made were (*a*) proceeds of a levy to cover administrative expenses and reserves, and (*b*) proceeds of a levy to provide premiums for special grades of milk etc. Before striking the pool prices, however, the sums available in the eleven regional pools were adjusted by means of the *inter-regional compensation fund* so that the pool prices should not differ from each other by more than 1d per gallon. Every farmer within a region obtained the regional pool price for his milk regardless of the actual prices which the buyers of that milk had paid for it.[1]

The inter-regional compensation fund was formed from the proceeds of an inter-regional compensation levy on all milk sold in the liquid market. This fund was a device for effecting a compromise between a single national pool and the eleven completely independent regional pools. The biggest payments into the fund came from those regions, such as the South-Eastern, where most of the milk produced was sold for liquid consumption in the highest priced market. On the other hand, the largest payments out of the fund were made to augment the pool prices of those regions, such as the Far Western, having a high proportion of low-priced manufacturing milk. But producers in the former regions had, in general, much higher costs of production than producers in the latter regions, and, in the absence of the scheme, these low-cost producers would eventually capture the high-priced market. The pooling scheme, with its device for inter-regional payments, was designed, however, to prevent this from happening or, at any rate, to cushion its happening. This it did by combining the elimination of under-cutting with the compensation in part of those farmers and those regions which were excluded from the more lucrative liquid-milk market.

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[1] The price paid to the farmer was, however, subject to certain transport and creamery deductions. Provision was also made for the payment of premiums to farmers supplying special grades of milk, or rendering services for which buyers were prepared to pay more than the contract price ; such premiums were not pooled, but were passed on direct through the Board to the producers concerned.

In this way the Milk Marketing Board in its price policy followed the twofold practice of the cartel. Thus it charged discriminating prices for its product in different markets, and it set the profit on sales in the high-priced markets against the loss on sales in the low-priced markets and shared it over the whole body of milk-producers. The first practice safeguarded the higher prices obtainable in the liquid-milk market from the depressing influence of the manufacturing market. The second practice safeguarded the status of the high-cost producers by eliminating undercutting on the part of their low-cost competitors.

To complete the picture of price-fixing it remains to deal with retail prices. The Milk Marketing Board had no statutory right to fix retail prices, but with the consent of buyers it could obtain such powers through a clause in the contracts. The Board did in fact concede to the demand of buyers that undercutting should be eliminated from the retail market. Thus the producer-retailer's licence for 1937–38 set out the actual prices below which milk could not be retailed. These minimum retail prices varied for different areas according to the density of the population, prices being higher in the larger towns than in the rural districts.

The activities of the Milk Marketing Board, however, have not been confined to the operation of the price-fixing machinery and control described above. On the contrary, the Board has sponsored a long-period programme aimed at increasing the market for milk, the encouragement of the production of high-quality milk and the development of the milk industry as a whole.

In aiming at the expansion of the market for milk, the Board concentrated on the encouragement of liquid-milk consumption. This was because liquid-milk sales represented the most remunerative outlet while milk consumption per head in this country was low, and was even tending downwards. In conjunction with the National Milk Publicity Council the Board launched a propaganda campaign using all the modern methods of publicity and advertising. It actively stimulated the setting up of milk bars and planned to introduce the milk-drinking habit to employees in works and factories. In the initial stages this publicity campaign was assisted by a substantial Government grant provided under the Milk Act of 1934.

But the bulk of the Government assistance provided by the Act of 1934 (and extended by subsequent Acts in 1936, 1937 and 1938) was used to finance the " milk in schools " scheme. Under this scheme the Board undertook to provide every child in state-aided schools with one-third of a pint of milk per day for consumption during school hours. From 1936 onwards the Board, in co-operation with the Commissioner for the Special Areas, engaged in experiments to supply at specially reduced prices one pint of milk per day to nursing and expectant mothers and to children under five years old. In 1940 these welfare milk schemes formed the basis for the National Milk Scheme which, together with the " milk in schools " scheme, became the main instruments of the Ministry of Food for getting liquid milk in adequate quantities, and on favourable terms, to those who needed it most. These schemes provide a splendid illustration of the deliberate use of differential prices as an instrument of social policy directing demand towards certain essential commodities. They are also, of course, in keeping with the Board's general practice of price-discrimination.

The Board has also encouraged the production of high-quality milk since it realized from the outset that public confidence in the quality of the supply was a necessary condition for any increase in demand. At the outset, producers of special grades of milk were exempted from the scheme, and sold their milk, independently. Later, after these special producers had been brought into the scheme, the Board decided to pay from its own funds a bonus to producers of "accredited" milk, and the Accredited Roll of milk producers was begun. When the Government introduced the Attested Herds Scheme designed to stimulate the eradication of tuberculosis from dairy herds the Board co-operated through working the bonus system which was adopted. By 1938 a scale of quality premiums was in operation as a part of the Government plan to improve production standards in the industry. Under this plan the Board paid premiums on an agreed scale to producers of quality milk and the Government augmented these bonuses by grants from the Treasury.

Finally, the Milk Board has taken several important steps to encourage the development of the dairy industry as a whole. First, in conjunction with the buyers of milk, the Board allocated about £10,000 per annum for research into the technical problems of the industry, to be carried out, in the main, by the universities and the research institutes. Secondly, in co-operation with the Board of Education and the Ministry of Health, the Board conducted a large-scale experiment to ascertain the nutritional value of milk to school children. Thirdly, since 1934 the Board has financed a big inquiry into the costs of producing milk on the farm, carried out by the Provincial Agricultural Economists stationed at universities and agricultural colleges, and designed to provide data useful both for price-fixing and for the study of the economic problems of the milk-producer. Fourthly, in co-operation with the Agricultural Economics Research Institute, Oxford, it conducted an investigation into the economics of milk consumption covering 20,000 households taken at random in selected towns. Fifthly, in more recent years the Board has devoted an increasing degree of attention to the improvement of the technique of milk production on the farm especially through taking over the administrative responsibility for milk recording and for artificial insemination.

In 1935 the Government appointed a Reorganization Commission to examine the working and effects of the four Milk Marketing Schemes in England and Wales and in Scotland. The report of the Commission was issued in 1936, and it contained proposals which would entail important changes of principle in the organization of the schemes. These proposals were based on two important principles. The first was that price control should be used as an instrument for promoting a planned policy for the milk industry in the interests of producers and of the community as a whole. The second was that, as price is the vital factor influencing production, distribution, manufacture and consumption the control of prices should rest in impartial hands and not in those of one of the interested parties.

The Reorganization Commission recommended, therefore, that a Permanent Milk Commission should be established to act as the central authority for the milk industry as a whole. This Commission was to be an independent and impartial body whose five members would be appointed by the responsible Ministers. The fixing of milk prices was to be taken out of the hands of the producers' boards and entrusted to the new Milk Commission. The principal function of the Commission would be to plan a production policy capable of meeting the nation's needs and to carry out that policy through the medium of prices. The Commission would therefore fix prices at a level which, in its judgment, would call forth the required production of milk from each region. The Commission was also to be responsible for administering any funds made available by the Government for the assistance of the industry. It was to submit annual reports to Parliament and make representations to the Government when called upon to do so or on its own initiative.

Two producers' Marketing Boards, one for England and Wales and one for Scotland, would be retained as an integral part of the new system. These two Boards would retain all the executive and administrative functions exercised by the existing boards, *except that of determining prices*. The boards would be under a statutory obligation to enforce, through their terms of contract, the prices fixed by the permanent Milk Commission.

The above important changes of principle needed new legislation to give them effect since they could not be implemented under the terms of the Agricultural Marketing Acts. In 1938 the Government introduced the *Milk Industry Bill* which, however, provided only for the partial implementation of the proposals of the Reorganization Commission. *Inter alia*, the Bill provided for (*a*) the setting up of an independent Milk Commission to have general supervisory powers over the industry, (*b*) the payment of subsidies on the production of clean and pure milk, (*c*) a price insurance scheme for milk used for butter and cheese, (*d*) the regulation of imports of milk and milk products, (*e*) the reorganization of distribution and the introduction of compulsory pasteurization schemes on the request of local authorities. The Bill met with considerable opposition and was withdrawn. Its provisions were still under examination when war was declared in 1939.

PRICE SUPPORT SCHEMES

Control by legally constituted producers' monopolies was not the only form of interference with the free-price system in British agriculture before 1939. The prices of several important farm products, for which no producers' marketing boards existed, were also " protected " from the automatic influences of demand and supply. This " protection " was afforded under the provisions of five separate Acts of Parliament to which brief reference must be made.

(1) *The Wheat Act, 1932*, fixed a *standard price* of 10/- per cwt. for home-grown millable wheat. The farmer first of all sold his wheat in the open market, when and to whom he chose and at the price he could get. At the end of each season the farmer then received a *deficiency payment* which consisted of the difference between the *average market price* and the *standard*

price multiplied by the quantity of his certified sales of wheat. This deficiency payment was made to all farmers irrespective of the prices which their wheat actually fetched in the open market. But to qualify for the bonus the farmer had to register with the Wheat Commission, and supply the Commission with certified returns of all his sales of wheat.

The Wheat Commission was a Government-appointed body set up to administer the Act. It consisted of a chairman, vice-chairman and 17 members representing the interests of wheat growers, millers, merchants, importers and consumers (including bakers).

Funds to meet the deficiency payments were raised by a levy collected by the millers on all flour used in Britain, whether produced from home or imported wheat, or imported as flour. No direct contribution from the Exchequer was involved.

In addition to the standard price, producers were also given an assured market since the Flour Millers' Corporation could be ordered to purchase, up to a certain limit, any stocks of millable wheat unsold in the hands of farmers at the end of the cereal year. On the other hand, the quantity of wheat to which the full standard price applied was limited by the Act to a maximum of 27 million cwt. in any cereal year. (This was raised to 36 million cwt. in 1937.) If, in any year, the total sales of millable wheat exceeded this limit, the deficiency payment was reduced *pro rata*.

The Wheat Act resulted in a substantial increase in wheat production in the United Kingdom, the wheat acreage in 1937 being 47 per cent above the level of 1931. The amount of subsidy paid to wheat growers varied from year to year according to the world situation. Thus in years when world wheat crops were short and prices not greatly below the standard price of 10/- per cwt. the subsidy was comparatively small. For example in 1936 the subsidy totalled £1,339,000 on a deficiency payment of only 13·53 pence per cwt. In 1938, on the other hand, when world wheat prices slumped, and the home crop was larger, the total subsidy increased greatly to £9,370,000 on a deficiency payment of 60·56 pence per cwt.

It has been argued that the method of the Wheat Act overcomes some of the economic objections inherent in all forms of price support. In particular, by allowing producers to sell in the open market the incentive to grow a superior product and to sell it to the best advantage is retained. Furthermore, by limiting the total quantity on which the subsidy is payable " competition amongst producers for this total payment is introduced, and it will ultimately procure the elimination of the inefficient, for as production increases, the effective price received by individual producers declines, with the consequence that those wheat growers whose land is unsuitable or whose methods are backward should be forced out of the business as the value of the deficiency payment falls." [1]

(2) *The Sugar Industry (Re-organization) Act, 1936*, provided for the support and fixing of the price of sugar-beet grown in this country. This Act was a consolidation of the various provisions under which the sugar-beet industry had received direct financial as well as fiscal assistance from the State since the passing of the British Sugar (Subsidy) Act in 1925.

The Act of 1936 set up the Permanent Sugar Commission which was to hold the key position in the sugar-beet industry. This Commission was an independent body elected by the Government. It was charged with the duties of " keeping under review the growing of sugar-beet, and the manufacture, refining, marketing and consumption of sugar in the United Kingdom, and of advising and assisting the Minister of Agriculture and Fisheries and the Treasury on matters relating to the sugar industry." Its duties included the keeping of a register of refiners of sugar, and the preparation and submission of a scheme for research and education for the approval of the Minister.

The Act also arranged for the re-organization of the industry through the amalgamation of the beet sugar manufacturing companies into a single company, the British Sugar Corporation, Ltd. The Government was to be represented on the board of the Corporation by three directors including the chairman.

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[1] C. S. Orwin, " The Wheat Quota," *Agricultural Progress*, vol. xii, 1935

It was the duty of the Corporation to enter into contracts with the farmers for the purchase of sugar-beet, and all sugar-beet was to be sold at fixed prices to the Corporation. The terms of these contracts, including the price to be paid for beet, had to be agreed between the Corporation and representative of the growers *after consultation with the Sugar Commission.* In default of agreement between the parties the price was to be fixed by the Commission. The maximum acreage in respect of which contracts could be entered into in any year was also to be fixed by the Commission. This was not to exceed an acreage (roughly 375,000 acres) estimated to produce a " standard quantity " of sugar equal to 560,000 tons of white sugar.

The price which the Corporation was able to pay the farmers was supported and made possible by a government subsidy paid to it at a rate prescribed for each year by the Sugar Commission. Every year the Commission determined the rate of subsidy after taking into account the size of the crop, the contract price to farmers, the Corporation's profits in the previous season and the price of raw sugar. This subsidy payment from public funds was the fundamental factor in the maintenance of the prices paid.

(3) *The Agriculture Act, 1937,* amongst other things, made provision for subsidizing the prices of oats and barley, the subsidy being paid on an acreage basis when the price of oats fell to 7/7 per cwt. or under. The subsidy per acre amounted to six times the difference between the average market price of oats and the " standard price " of 8/- per cwt., subject to a maximum subsidy of £1 per acre. This virtually guaranteed the grower of oats a price of 8/- per cwt. in respect of two-fifths of his crop. This apparently complicated provision was thought to be necessary because a very large proportion of the

oat crop and of the barley crop is produced for consumption on the farm and is not normally marketed. The two-fifths was estimated as approximately the proportion of the oat crop to be sold normally off the farm. The rate of subsidy for land under barley was to be the same as that for land under oats. The subsidies were payable on an acreage limited to 110 per cent of the acreage of oats and barley qualifying for payment in 1937. As in the case of wheat, if production in any year exceeded this " standard acreage " the rate of subsidy was reduced *pro rata*.

(4) *The Livestock Industry Act, 1937*, made arrangements for the payment of a subsidy to the producers of fat cattle in the United Kingdom. In effect the Act made permanent the provision whereby an Exchequer subsidy, on a temporary basis, had been paid to the home producers of certain classes of fat cattle under the Cattle Industry (Emergency Provisions) Acts of 1934 to 1936. But the Act of 1937 also made provisions for the reorganization of the fat cattle industry in this country.

The most important provision was the setting up of the Livestock Commission. This was an independent and impartial body of nine members appointed by the Minister of Agriculture and the Secretaries of State for Scotland and Northern Ireland. The main functions of the Commission were (*a*) to keep generally under review the production, marketing and slaughtering of livestock, and related matters ; and (*b*) to advise and assist the ministers and in particular to draw up and administer a cattle subsidy scheme. A Livestock Advisory Committee, representative of all livestock interests, was also appointed to assist the Commission.

The Act provided for the payment of a subsidy to the producers of fat cattle. This subsidy was paid in such a way as not to discourage the production of good quality fat cattle. Thus a subsidy of 7/6 per cwt. was given for well-finished animals as against a subsidy of 5/- per cwt. for ordinary beasts. A higher rate of subsidy was also given to home-bred as distinct from imported animals. These subsidies were to be paid by the Livestock Commission from the Cattle Fund which had been established under the emergency Act of 1934. This Cattle Fund was to be maintained by a direct Government grant, a maximum sum of £5 million per annum being voted annually by Parliament for the purpose.

Provision was also made for the regulation of imports in order to secure stability in the home market. Thus the Board of Trade was given the power to regulate imports of livestock and meat (except bacon) by order. This power was intended to be used only in the event of a break-down in the arrangements already in force by which supplies were regulated by agreement with the importing countries.

Finally, the Act of 1937 contained provisions (1) to enable the Livestock Commission to prepare livestock markets orders and by-laws ; (2) to conduct three experiments in large-scale central slaughtering ; and (3) to promote service schemes, to be carried out by authorized bodies, for the promotion or conduct of research and education, the collection of statistics, insurance, advertisement and for the improvement of livestock breeding.

(5) *The Agricultural Development Act, 1939*, contained one clause which gave powers to the Livestock Commission to administer a scheme for a fat sheep subsidy, on lines similar to the wheat subsidy. It provided that payment should be made on sales of fat sheep in the United Kingdom to the amount by which the average market price was less than the " standard price." The basic annual standard price was fixed at 10d per lb. dressed carcase weight, this being subject to a *pro rata* reduction if the sheep population of the United Kingdom in any year rose above 27 millions.

AGRICULTURAL PROTECTION

The prices of British agricultural products before 1939 were also buttressed, to a certain limited extent, by the adoption of a protectionist policy in 1931. Indeed, the first essay in the new protectionist policy was specifically concerned with the products of agriculture. This was the Horticultural Products (Emergency Customs Duties) Act of 1931. This Act imposed fairly heavy duties on the imports of certain luxury fruits, flowers and vegetables. But the Act, which was limited in duration to one year, has been aptly described as " more of a sumptuary law than as an Act of agricultural or horticultural protection."

The general tariff was introduced by the Import Duties Act, 1932. This Act was designed to protect industry in general and applied a 10 per cent *ad valorem* duty on all goods imported from foreign countries with the exception of those goods placed upon the " free list " and of those goods for the time being subject to duty under some other arrangements. Goods from the Dominions, British Colonies and Protectorates were permitted free entry. These exemptions meant that, in fact, the main items of agricultural imports, notably wheat and meats of all kinds, escaped the incidence of the tariff. The Act also set up the Import Duties Advisory Committee as an impartial body with power to consider the claims of individual commodities and to recommend the imposition of new or additional duties.

The third stage in the development of the tariff structure was the Ottawa Agreements Act, 1932, which gave legislative effect to the agreements made at the Imperial Economic Conference earlier that year. This Act changed some of the *ad valorem* duties, such as those on butter and eggs, to specific duties, the alterations generally resulting in a higher level of duties on goods imported into the United Kingdom from foreign countries. But the really important tariff result of the Ottawa Agreements was that the Dominions were assured a free market for agricultural products in the United Kingdom for a period of five years up to 1937.

The Ottawa agreements also inaugurated another method of protection for British agriculture. This was the quantitative control of imports by means of compulsory quota regulations. The Board of Trade, after consultation with the Minister of Agriculture and Fisheries, was given powers to regulate quantitatively the imports of frozen mutton, frozen beef and chilled beef from foreign countries. In addition to these compulsory quotas, there were several " gentlemen's agreements " with both empire and foreign exporting countries for a curtailment or limitation of imports into the United Kingdom of milk and cream, potatoes, fat cattle, oats and eggs.

Finally, as already stated, the Agricultural Marketing Act of 1933 linked the quantitative regulation of imports with the principles of marketing organization incorporated in the earlier Act of 1931. In particular the Board of Trade was given powers to regulate the quantities of imports of any product for which a marketing scheme was in force or projected. The Livestock Industry Act, 1937, removed the control of meat (other than bacon and hams) from the operation of the Agricultural Marketing Act, and gave the Board of Trade specific authority to control imports of livestock and meat as regards both quantities and qualities. During 1937 also, imports of most types of beef and veal from foreign countries became subject to duties under the Beef and Veal Customs Duties Act, while quantitative regulation of these imports came under the supervision of an International Beef Conference and an Empire Beef Conference.

The above protectionist measures, however, did not influence agriculture a great deal nor did they have any marked effect on agricultural prices. This was partly due to the exclusion of many of the staple products from the Import Duties Act, and partly to the preferential treatment given to agricultural imports from empire countries. This situation, in turn, reflected certain conditions which rendered it extremely difficult to give assistance to British agriculture through protectionist measures. Three of these conditions are of special significance.

In the first place the straight tariff on agricultural imports into this country was not effective in reducing supplies. This was mainly due to the preponderating dependence of the exporting countries on the British market. For example, in 1930 the following proportions of the world exports of certain agricultural commodities were absorbed by Great Britain: 99 per cent of bacon and hams, 96 per cent of mutton and lamb, 63 per cent of butter, 62 per cent of eggs, 59 per cent of beef, 46 per cent of cheese. In view of these figures it is no wonder that imported supplies proved highly inelastic, and that the same amount of imports continued to come in in spite of the tariff. This meant, of course, that the tariff did not help British farmers through restricting supplies and thereby raising the prices of the home-grown produce.

Secondly, since several of the more important food-exporting countries were Empire Countries, the control and restriction of imports into Great Britain was, essentially, a matter of importance in imperial politics. Indeed, the objects of the various methods of import control were stated to be twofold: first, to give the home producer a larger share of the British market, and, secondly, to give the Empire producer a larger share of what was left. The implementation of this twofold policy resulted, in fact, in a situation where British farmers had to compete with a slightly larger volume of total supplies from abroad than they did before the introduction of protective measures. This feature is well illustrated by the statistics of the imports of twenty-eight commodities which competed most directly with the products of British agriculture. The *total volume* of these imports in 1938 was 6 per cent above the average for 1927–29 notwithstanding that the corresponding imports from *foreign* countries had dropped by 17 per cent.[1]

Finally, even when the quota method was used and imports were either compulsorily or voluntarily reduced, the expected advantageous result on the price of the home-produced commodity did not always materialize. The explanation for this is to be found in the fact that the home-produced commodity often differed in kind or in quality from the imported commodity bearing the same name. In other words, the home-produced commodity and the imported commodity were not directly competitive since they were often bought by different classes of consumers. The case of the quota restrictions on Danish bacon has often been cited as a notable example of this situation ; the restriction of imports increased the price of Danish bacon far more than the price of the home-produced variety.

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[1] Murray and Cohen, *The Planning of Britain's Food Imports* (Fifth Supplement, Oxford 1939)

PRICE STABILITY AND PLANNING

With the passing of the first Agricultural Marketing Act in 1931, it might be said that the first tentative steps were taken towards a managed economy in agriculture. The progess of development during the nineteen-thirties was not consistent or uniform on the lines of a managed economy. For example, the main steps taken in regulation of imports in the early thirties were protectionist in an old-fashioned sense. On the whole, however, there was a noticeable effort in the national agricultural policy to establish stability which was not purely protectionist.

The three positive methods used to secure this stability were the agricultural marketing schemes, the control of imports by quota regulations, and the price support schemes administered by the independent commissions. It is of interest to note that all the price support schemes were adopted after the passing of the first Agricultural Marketing Act, and all, except the Wheat Act, were adopted some years after the last of the Marketing Boards had been established. These later schemes had three features in common which, together, raise considerations of fundamental importance in considering the provision of financial assistance to British agriculture.

First, the administration of the price support schemes described on pages 274–9 was not in the hands of the producers themselves, but was entrusted to independent and impartial bodies—the Wheat Commission, the Sugar Commission and the Livestock Commission. This represents an important change from the boards set up under the Agricultural Marketing Acts since those were exclusively producers' boards having no responsibility to the public or even to agriculture as a whole. The independent nominated commission, on the other hand, is primarily representative of public interest. It provides an important safeguard against the abuse of the monopoly powers for fixing prices and controlling supplies conferred by the Agricultural Marketing Acts. The need for some such safeguard was also recognized in the new Bacon Development Board set up under the Bacon Industry Act, 1938, as well as in the Milk Commission proposed in the abortive Milk Industry Bill introduced in the same year. Moreover, these independent bodies should find it easier to concentrate their attention on planning and development, while producers' boards inevitably tend to be preoccupied with stabilization and restriction. This view was cogently advocated in 1947 in the report of the so-called *Lucas Committee* appointed to review the working of the Agricultural Marketing Acts.

Secondly, the price support administered by these commissions was made available from public sources either in the form of a processing tax as in the case of the wheat subsidy, or in the form of a direct Exchequer grant as in the case of the subsidies for oats, barley and sheep.

Thirdly, since the price subsidy was forthcoming from public sources, safeguards were introduced to limit the *total* liability to the country. Thus for cereals and sheep (and, to a lesser extent, sugar-beet) the provisions tied prices to stated quantities of output, and for cattle the subsidy was not to exceed a stated total sum. There are two essential principles involved in these safeguards. The first is the need to avoid giving an excessive amount of inducement to produce commodities which are not really needed above a given quantity. Indirectly this means also avoiding the placing of a premium on inefficient production through giving producers an incentive to expand output with impunity. The second principle is to ensure, to some extent at least, that the burden on the State and on consumers is not out of proportion to the benefits given to the producers of the subsidized products.

With the outbreak of war in 1939 the free-price system was largely placed in abeyance. The Government, through its accredited representatives, fixed the prices of all the major products of British agriculture. The prices of essential foods were fixed in order to enable all to buy the basic rations, and also to keep down the cost-of-living index number, thereby checking demands for wage increases and hence to prevent inflation. The official policy was designed, however, to use the fixing of prices as a lever to direct resources into the production of priority products such as milk, wheat, potatoes and sugar-beet. In some cases, at a later stage, this was buttressed by payments of special subsidies over and above the fixed price of the product, e.g. £3 an acre on wheat, and £10 an acre on potatoes. Moreover, where the price incentive was insufficient the Government exercised the right to direct producers to produce the required commodities. Finally, the Government itself either purchased, or controlled the purchase of, most of the staple farm products. It then sold these products to consumers at prices sometimes below the prices paid to the farmers, the gap between total receipts and total payments being met out of public funds.

In the closed economy of war, therefore, the farmer was given an assured market for his total output at fixed prices. But this was only possible because war-time conditions made it also possible to ignore the three economic difficulties inherent in any system of fixed prices. The first of these difficulties is the almost insuperable one of "coercing consumers to buy at higher prices the volume they would voluntarily buy at lower prices." As stated above this was solved by the expedient of selling to consumers at lower prices than those paid to producers. The second difficulty is that of finding a satisfactory substitute for competitive prices as the incentive to producers to lower costs and to cheapen production. But in war the sole concern was with maximum output irrespective of costs. The third difficulty is concerned with ascertaining the level at which prices shall be fixed having regard to the great range of costs as between one producer and another. But the fixed prices of war-time paid little attention to those great disparities in the physical conditions of production which are responsible for this range, though the changes in prices which were made from time to time were supposed to be influenced by changes in costs.

This last feature of maintaining some association between changes in fixed prices and changes in production costs was retained in the policy introduced in December 1944, and subsequently reaffirmed and developed in November 1945. Under this policy the war-time system of guaranteed prices and assured markets was continued. The Agriculture Act, 1947, embodies these measures of guaranteed prices and assured markets as permanent features of the country's wider agricultural policy. This wider policy is stated in the Act to be the promotion and maintenance of " a stable and efficient agricultural industry capable of producing such part of the nation's food and other agricultural produce as in the national interest it is desirable to produce in the United Kingdom, and of producing it at minimum prices consistently with proper remuneration and living conditions for farmers and workers in agriculture and an adequate return on capital invested in the industry."

The guarantee of prices and assured markets is to apply to the following products : fat cattle, fat sheep, fat pigs, milk, eggs, wheat, barley, oats, rye, potatoes and sugar-beet. These eleven commodities together represent over 70 per cent by value of the agricultural production of the country, and the only important omissions are horticultural products and wool. Powers are given, however, to add to this list ; but there is no power to remove any product from the original schedule.

The machinery by which the guaranteed prices and markets are fixed has come to be known as the *Price Review System*. The reviews take place annually during the month of February, and the first was held in February 1945. The system is based essentially on what may be termed the " forward-pricing plan," whereby the Government announces in advance of a crop year or a livestock cycle the prices it will guarantee at its end. The purpose is to eliminate price fluctuations during any one production period so as to enable farmers to plan reasonably far ahead by giving them adequate notice of changes in prices and other factors which affect the amounts payable to them.

Thus, for the crop products concerned, prices and other relevant factors affecting these crops are fixed in the same year as that in which the review is held and are to relate to the crops harvested in the year beginning on 1st July of the next calendar year. For example, in the case of the February 1947 review the determination of prices and other relevant factors which had to be made in 1947 related to crops harvested in 1948, a similar review in February 1948 relates to crops harvested in 1949 and so forth.

In view of the longer length of the livestock cycle a dual price system is used for fat stock, milk and eggs. There are *minimum prices* on the one hand, and the Government ensures that the *actual prices* shall not fall below the minimum levels. For the fixing of minimum prices a system of four-year overlapping periods with biennial announcements is adopted. For example, in February 1950 minimum prices will be fixed to cover the period 1952 to 1954, and in February 1952 a similar review will cover the period 1954 to 1956, and so forth. As with the crop products, the actual prices (which may be higher, but must not be lower than the minimum prices) will be fixed for twelve monthly periods after the annual February reviews. The result is that producers of fat stock, milk and eggs will know the actual prices for their products one year ahead, and they will know the minimum prices for two to four years ahead.

It is also possible to hold special price reviews in between two February reviews if circumstances involving a sudden and important change in the economic conditions of the industry, such as a substantial alteration of costs of production or any other special cause, warrants such a procedure.

At the annual February reviews the Government is under an obligation to consult with the representatives of farmers for the purpose of reviewing " the general economic conditions and prospects of the agricultural industry." There is no limit to the scope of these discussions, though certain matters will normally be examined at every annual review. It is known, for instance, that a large body of statistical data collected by means acceptable to the Government and to the industry is scrutinized. These data relate to trends in the net income of the " national farm," the incomes of different types and sizes of farms, the cost-structures of individual farm products as well as other matters pertaining to the financial position of the industry. It has also been arranged for index numbers to be made available showing the trend of farming profits in relation to the incomes of the rural population gainfully occupied other than in farming. But factors " not readily reducible to statistical form are also considered. Attention is given, for example, to consumer requirements in relation to import programmes, and decisions are influenced by views as to the amount of price incentive required to obtain from home sources consumer requirements which will not be met by import programmes. Recognition is also given to the necessity for maintaining a proper balance in farming." [1]

The review procedure is thus concerned with a whole complex of considerations on which the representatives of the Government and of the farmers give their views. But it is important to note that any recommendations arising from the reviews are not necessarily final. The Government has the right to vary the recommendations, and the annual price schedule which finally emerges is the responsibility of the Government alone.

This schedule is supposed to be fixed with due regard to the need for maintaining and promoting the greatest possible efficiency and economy in methods of production. Account is also taken of any modifications in the character of the agricultural output which may be necessary to meet changing national requirements. In this connection the Government has the power to apply quantitative limitation to any section of the assured home market. So far the limitation of output has not been a factor to reckon with, for all the food that could be produced in this country has been needed, and the reality to be faced has been the fixing of prices high enough to encourage the production of this food. In the event of limitation of output being necessary it is laid down that it "shall only be imposed as nearly as may be at the same time as determinations are made regarding prices and other factors. This gives effect to the general principle that a guaranteed price is of little value to a farmer unless he knows at the time what volume of produce is covered by that guarantee of price."[1]

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[1] W. E. Heath, "Price Fixing Policies in Agriculture," *J. of A.E.S.*, vol. viii, No. 1, 1948, p. 7

It is clear that the price review system outlined above is designed to reconcile a reasonable measure of price stability in the short run with the need for price adjustments to keep production in the long run abreast of general economic conditions. It can readily be conceded that the system is capable of achieving a high measure of stability in the relatively short period. In particular it has the substantial merit of eliminating any disconcerting fluctuations in farm prices occurring *within a given production period.* In the past it was these sudden and violent price fluctuations which made farming largely a gamble, notwithstanding the fact that planned physical production is a first essential of good husbandry. Such fluctuations undoubtedly reflected some of the real wastes and inefficiencies of the free-price system ; they benefited neither producer nor consumer. But stability for farmers in the short run can be purchased at too high a cost if, in the long run, the method of securing it also encourages an uneconomic degree of rigidity in the structure and scale of the agricultural industry itself. There is no evidence yet on which to form any opinion about the effectiveness of the provisions for ensuring those other changes in prices which are vitally necessary to encourage progressively efficient technical production, and to steer production into those channels indicated as economically desirable by changing national and international conditions.

[1] Agricultural Bill. Explanatory Memorandum (Cmd. 6996, 1946), p. 6

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